The copy filmed here has been reproduced thanks to the generosity of:

National Library of Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▽ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:

L'exemplaire filmé fut reproduit grâce à la générosité de:

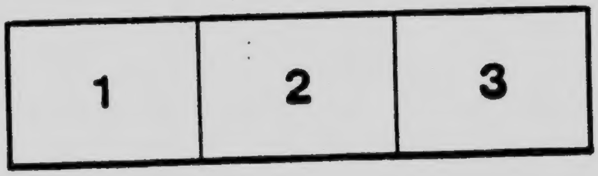
Bibliothèque nationale du Canada

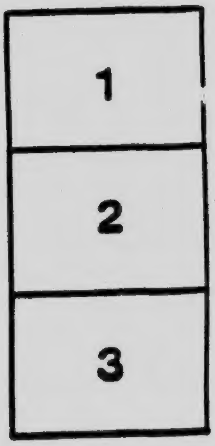
Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

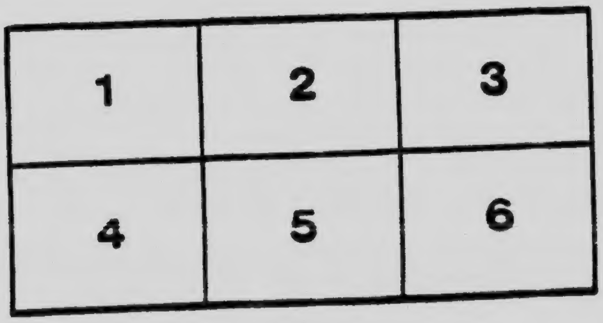
Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▽ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.







"SCHOOL HELPS" SERIES

Mental Arithmetic

PART I.

BY

CHAS. G. FRASER

PRICE - 15 CENTS

THE EDUCATIONAL PUBLISHING CO.
LIMITED
TORONTO, 1910

QA 103
F85
1910

MENTAL ARITHMETIC

PART I.

BY

CHAS. G. FRASER,
Assistant Master, Gladstone Ave. School, Toronto

PRICE - - 10 CENTS.

THE EDUCATIONAL PUBLISHING CO
TORONTO, 1899.

QA 103
F55
1910
***

Entered according to Act of Parliament of Canada, in the year one thousand eight hundred and ninety-nine, by the Educational Publishing Company, at the Department of Agriculture.

PREFACE.

The complaints that business men are making of the lack of accuracy and thoroughness in the rising generation, would indicate a lack of system in presenting the subject of arithmetic, or insufficient drill to firmly ground the principles presented. We have perhaps been taking up too many subjects, taking them up at the same time, and in the same lesson, and the result is unsatisfactory. We have been taking up subjects that require faculties which are not developed and do not naturally mature at an early period of the child's life. The old rule, *One thing at a time, and that done well*, is being discarded, and we are of the opinion that this is being done at the sacrifice of the true development of the child.

In the two little "School Helps" which we now place before the public, we have endeavored to supply a set of questions so graded that, under the supervision of the teacher, the pupil himself will take step after step with little "telling,"—so logical as to be natural—so difficult as to call for effort—so full as to be thorough. The pupil will thus be led to have a confidence in himself, and be so thorough that he will not need to stop and think to tell how much 6 times 9 is. The province of the teacher has not been invaded by inserting pages to explain how to add or subtract ; but the questions suggest the successive steps in the presenting of the subject, and the books can be used in the teaching of it

In the few pages at our disposal we have included over 20,000 questions, covering the whole field of public school arithmetic. To secure this great number of questions we have resorted to an expedient which we believe to be original, and which enables us to include three questions in the space usually occupied by one, by inserting, in brackets, the numbers for the additional questions. These may, or may not, be used at the discretion of the teacher; but even in these we have endeavored to have the questions progressive. The example: "*I bought a sheep for 8 (4, 7) dollars, and sold it to gain 2 (5, 3) dollars. How much did I get for it?*" is really three questions involving the addition of 8 and 2, 4 and 5, and 7 and 3.

The work has been divided into two parts. The first includes Numeration and Notation, Addition, Subtraction, Multiplication, Division, and Weights and Measures, which includes Reduction and the Compound Rules. The second part includes Measures and Multiples, Vulgar Fractions, Decimal Fractions, Percentage, Mechanical Measurements and Type Questions. Each chapter takes up its work sufficiently thoroughly for our most advanced classes, and concludes with an exercise on theory which, we trust, will lead to the mastering of the whys and wherefores of the rules of Arithmetic.

C. G. F.

TORONTO, AUGUST 10TH, 1899.

NUMERATION AND NOTATION.

Arithmetic is the science which treats of numbers.

A Unit is a single thing.

A Number is a unit, or a group of units.

Numeration is the art of expressing numbers in words —orally, or in writing.

Notation is the art of expressing numbers by symbols — figures, or letters.

There are two systems of notation —Arabic, and Roman.

Arabic Notation.

Arabic Notation is a method of expressing numbers by means of ten figures— 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

Figures are symbols used to represent numbers.

The Digits are the figures 1, 2, 3, 4, 5, 6, 7, 8, 9.

0 is called zero, cipher or naught. It has no value of its own, but is used to give the proper position and value to the other figures.

Arabic Notation is a decimal system—ten of each denomination making one of the higher denomination.

The Denomination of each figure is indicated by its position in the number.

A Period consists of three figures, named from the right, **units, tens** and **hundreds**, respectively.

Beginning at the right, the periods are named **units, thousands, millions, billions, trillions, quadrillions, quintillions, sextillions, septillions, octillions, nonillions, decillions,** etc.

1,000,000,000,000,000,000,000,000,000,000,000.

Exercise 1.

(1) Read the following numbers.
(2) Write them in words.
(3) Teacher dictate ; pupils write :—
 (a) In figures. (b) In words.

A.

1. 5, 4, 6, 9, 3, 8, 7, 2, 1.
2. 10, 20, 30, 40, 80, 60, 50, 90, 70.
3. 20, 25, 28, 27, 24, 26, 29, 23, 22, 21.
4. 30, 37, 34, 39, 42, 45, 43, 46, 52, 57, 59, 54.
5. 63, 68, 66, 67, 75, 74, 73, 78, 89, 86, 80, 85.
6. 93, 96, 94, 99, 83, 76, 69, 44, 88, 98, 89, 45.
7. 37, 68, 95, 82, 60, 35, 58, 87, 90, 14, 28, 11.

B.

1. 100, 200, 300, 800, 600, 500, 900, 700, 400.
2. 120, 130, 140, 190, 260, 350, 490, 780, 970.
3. 108, 101, 109, 103, 107, 102, 106, 104, 110.
4. 118, 124, 137, 145, 163, 189, 156, 172, 191.
5. 237, 356, 428, 842, 785, 666, 573, 999, 873.
6. 687, 354, 209, 613, 875, 889, 647, 803, 905.
7. 158, 309, 68, 932, 206, 602, 670, 359, 412.

C.

1. 1, 10, 100, 1000, 2000, 8000, 6000, 5000, 9000.
2. 1428, 2356, 5697, 6832, 8727, 3945, 4289.
3. 5206, 7501, 9405, 8308, 3906, 6804, 2607.
4. 3067, 5074, 8083, 4095, 6059, 9048, 2036.
5. 6820, 9590, 3750, 8470, 5680, 4590, 7980.
6. 8354, 6079, 3760, 5809, 9360, 3096, 3900.
7. 3009, 6250, 8004, 9060, 7006, 3008, 4090.

D.

1. 1284, 3563, 8745, 3928, 4793, 7436, 2857, 9688.
2. 9406, 2304, 3207, 5801, 7502, 8609, 4703, 6908.
3. 5082, 7046, 3029, 9083, 2028, 6015, 8047, 4094.
4. 3060, 5040, 8020, 9080, 7090, 6030, 4070, 2050.
5. 8001, 9002, 4008, 6009, 5007, 7005, 2006, 3004.
6. 10460, 52736, 92849, 28467, 17928, 67384, 49297.
7. 15075, 50500, 70005, 18067, 60070, 30200.

E.

1. 50001, 60009, 70500, 90200, 80100, 106255.
2. 28473, 158469, 296384, 477562, 734856, 926510
3. 209080, 706308, 507204, 703406, 802509, 830720.
4. 640830, 950270, 805060, 920005, 370001, 505707, 600006, 500050, 330303.
5. 2850720, 7093460, 9020408, 19070300, 26002380, 15020475, 84006580, 50050200, 60000500.
6. 72000070, 93002001, 48000201, 96000020, 48007000, 50080000.
7. 900004300, 250030502, 702300605, 18052000, 700308700, 805000000, 837026384, 286025001, 120020200, 175062026, 300000030, 127072000.

F.

In Arabic notation the value of a figure depends on its position in the number. Show this by giving the value of each of the figures in the following numbers :—

734,568,986. 803,560,089. 990,608,094.
397,875,243. 700,504,007. 503,086,240.

Give the value of any two consecutive figures.

Give the value of any three consecutive figures.

Write each of the numbers in words, paying attention to the spelling, hyphens, commas and periods.

Roman Notation

Roman Notation is a method of expressing numbers by means of seven letters.

The characters in Roman Notation are :—

I=1; V=5; X=10; L=50; C=100; D=500; M=1000.

Small letters are sometimes used instead of capitals.

Exercise 2.

A.

In Roman Notation a character placed before one of equal or less value is added to it.

(1) Read the following numbers.
(2) Write them in words.
(3) Express them in Arabic notation.

1. I, V, X, L. cccxx, ccxv, dxvii.
2. II, XX, XXX, XXV. dcxvi, dlxxv, dclx.
3. VII, XII, XV, LX. md, dcx, dxxviii.
4. VIII, XIII, XVIII, mmmcxxi, mdclxv, mcxxv.
5. XVI, XXVI, LVI, mcclxxx, dcclxvii, mcxxv.
6. XVII, XXXII, C. ccclxxviii, mdcxvi, mcxxviii.
7. CC, XXXVI, LXII. mdclxvi, mdclxvi, mdclxvi.

B.

Express the following numbers in Roman notation :—

1. 2, 6, 7, 12. 1250, 1375, 2560, 3583.
2. 15, 25, 38, 66. 2325, 2156, 3187, 2632.
3. 23, 36, 75, 87. 2153, 1567, 3231, 1725.
4. 32, 58, 63, 85. 2056, 3506, 2605, 1065.
5. 125, 250, 355, 375. 2378, 3028, 2308, 3802.
6. 550, 520, 580, 635. 2738, 2807, 2007, 2008.
7. 625, 637, 756, 767. 3027, 3087, 3078, 3020.

C.

In Roman Notation a character placed before one of greater value is subtracted from it.

Write these numbers in Arabic notation.

1. IV, IX, XIV. cmlx, cdlix, cxix.
2. IX, XXIX, XL. mcdx, mxlix, cxliv.
3. XXIV, XL, XXIX. mcmxc, mcdxxvii, cmxxix.
4. XLV, XLIV, XLIX. dcxlix, cdxciv, dxcvi.
5. XCV, XLVI, XLVIII. dccxcvi, cmlxix, cxcviii.
6. CD, XCIX, CM. dxlix, cxliv, cxciv.
7. CM, XCVI, XLXI. mcmxlix, cdxxiv, xcvi.

D.

In Roman Notation a dash placed over a number increases its value a thousand fold.

1. $\overline{\mathrm{V}}$, $\overline{\mathrm{X}}$, $\overline{\mathrm{XX}}$, $\overline{\mathrm{IV}}$. $\overline{\mathrm{vi}}$, $\overline{\mathrm{xii}}$, $\overline{\mathrm{xl}}$, $\overline{\mathrm{xc}}$.
2. $\overline{\mathrm{XV}}$, $\overline{\mathrm{XL}}$, $\overline{\mathrm{LXVI}}$, $\overline{\mathrm{LX}}$. $\overline{\overline{\mathrm{xv}}}$, $\overline{\overline{\mathrm{lxxv}}}$, $\overline{\overline{\mathrm{ccxlv}}}$.
3. $\overline{\mathrm{VII}}$, $\overline{\mathrm{XXI}}$, $\overline{\mathrm{XLV}}$, $\overline{\mathrm{XC}}$. $\overline{\overline{\mathrm{cdlxxxv}}}$, $\overline{\mathrm{cmxix}}$, ccxlv.
4. $\overline{\overline{\mathrm{XVII}}}$, $\overline{\overline{\mathrm{XXXIII}}}$, $\overline{\mathrm{XLVI}}$. $\overline{\overline{\mathrm{cxixccxxv}}}$, $\overline{\mathrm{cdxxi}}\mathrm{cmxlvii}$.
5. $\overline{\overline{\mathrm{DC}}\mathrm{XV}}$, $\overline{\mathrm{CDIX}}$, $\overline{\overline{\mathrm{DC}}\mathrm{XCI}}$. $\overline{\overline{\mathrm{dccxcv}}\mathrm{dlv}}$, $\overline{\overline{\mathrm{cmlxix}}\mathrm{dclx}}$
6. $\overline{\overline{\mathrm{XXIX}}}$, $\overline{\mathrm{XLVI}}$, LXXV. $\overline{\mathrm{cmxlxv}}$, dcxcvii, $\overline{\overline{\mathrm{xxix}}}$.
7. $\overline{\mathrm{XCV}}\,\overline{\mathrm{CDXLV}}\mathrm{CMXVI}$. $\overline{\mathrm{xl}}\,\overline{\mathrm{cdl}}\mathrm{viicmxcix}$, $\overline{\overline{\mathrm{mm}}}$.

E.

Express the following numbers in Roman notation :—

1. 14, 19, 24, 39, 44. 369,472,591.
2. 49, 64, 89, 94, 99. 800,104,610.
3. 204, 309, 444, 494. 253,547,059.
4. 449, 499, 944, 979 790,203,875.
5. 904, 929, 947, 999. 936,049,408.
6. 405, 946, 946, 694. 453,094,949.

Exercise 3.

1. Show that Arabic Notation is a decimal system of notation.

2. Show the difference between a figure and a number.

3. How many units in 7 tens? 9 tens? 4 hundreds?

4. Show the value of arrangement in Roman Notation.

5. Show that the value of a figure, in a number in Arabic Notation, depends on its position in the number.

6. How many tens will make 5 hundreds? 6 thousands?

7. What is the largest number that can be expressed by the figures 2, 3, 4 and 5?

8. What is the smallest number expressed by the figures 2, 3, 4 and 5? 7, 0, 8 and 3?

9. When are naughts used in writing numbers?

10. Show that "0" may, or may not, alter the value of a figure.

11. Write down the largest number of two figures, and the smallest number expressed by three figures.

12. Write down all the numbers of three figures you can, using the figures 1, 2 and 3; 6, 5 and 8; 9, 0 and 7.

13. Write down the four numbers that can be expressed by the figures 7 and 8.

14. Write down in ascending order, all the numbers that can be expressed by the figures 4, 7 and 0; 5, 9 and 2.

15. Where is Roman Notation usually used?

16. Account for the form of the number four, on the dial of a clock.

17. What is meant by the local value of a figure?

18. Show the relation of each figure to each other in the number **555,555.**

ADDITION.

Addition is the process of finding the sum of two or more numbers.

The Addends are the numbers which are to be added together. They must be of the same kind.

The Sum is the number obtained by adding two or more numbers. It is also called the **Total, Amount,** or **Aggregate.**

+ **(plus)** is the sign of addition, and when placed between two numbers it shows they that are to be added together.

= is the sign of equality.

4+2=6, is read, "four plus two, equals six."

Exercise 4.

How many are :—

1. 1 boy and 1 boy? 3 hats and 1 hat?
2. 1 girl and 1 girl? 1 pin and 3 pins?
3. 2 men and 1 man? 2 hats and 2 hats?
4. 2 apples and 1 apple? 3 caps and 1 cap?
5. 1 pencil and 2 pencils? 3 plums and 2 plums?
6. 1 book and 2 books? 2 pears and 3 pears?
7. 2 books and 2 books? 3 cherries and 3 cherries?

Exercise 5.

1. Jane has 1 (2, 3) apples and Will has 1 apple. How many apples have the two?

2. Tom had 2 (3, 1) plums and his mother gave him 2. How many had he then?

3. Will found 1 (2, 3) apples under one tree and 3 apples under another. How many apples did he find?

4. Mary has 2 (3, 1) cents in one hand and 2 (1, 3) cents in the other. How much has she in both hands?

5. A boy had 3 (2, 3) pens and he buys 3 (3, 2,) pens. How many has he now?

6. Rob had 3 (2, 2) dollars and earns 2 (3, 2) dollars. How much money has he now?

7. A boy had 4 (3, 2) figs and gets 1 (3, 4) fig. How many has he now?

Exercise 6.

How many are :—

1. 1 and 1? 1 and 3? 3 and 4? 3 and 5?
2. 2 and 1? 2 and 3? 4 and 4? 5 and 4?
3. 1 and 2? 4 and 1? 5 and 1? 4 and 5?
4. 2 and 2? 1 and 4? 1 and 5? 5 and 5?
5. 3 and 1? 2 and 4? 2 and 5? 6 and 1?
6. 3 and 2? 4 and 2? 5 and 2? 6 and 2?
7. 3 and 3? 4 and 3? 5 and 3? 6 and 3?

Exercise 7.

1. Jack has 2 (4, 3) marbles and Will has 1 (1, 3) marble. How many have the two together?

2. Tom has 2 (5, 5) cents and Mary has 2 (1, 3) cents. How much money have the two together?

3. I have 3 (2, 5) pens in one hand and 2 (5, 4) in the other hand. How many pens have I?

4. One field contains 1 (5, 4) acres and the next field contains 3 (2, 3) acres. How much land is in the two?

5. One hat cost 4 (5, 6) dollars and another cost 2 (5, 2) dollars. Find the cost of the two.

6. One hen has 3 (6, 3) chicks and another has 4 (1, 5) chicks. How many chicks have the two?

7. A man has 4 (5, 4) dollars in one pocket and 4 (4, 6) dollars in another. How much money in both?

Exercise 8.

How many are :—

1. 3 men and 3 men? 7 slates and 3 slates?
2. 4 cords and 3 cords? 6 pecks and 7 pecks?
3. 4 roses and 4 roses? 8 gallons and 7 gallons?
4. 5 horses and 4 horses? 8 quarts and 8 quarts?
5. 3 pens and 5 pens? 6 dogs and 8 dogs?
6. 5 weeks and 6 weeks? 7 cats and 9 cats?
7. 6 days and 7 days? 5 yards and 9 yards?

8-3-21

ADDITION TABLE 1.

Add at sight, or as the teacher points.

1 1	1 2	1 8	1 3	1 5	1 6	1 4	1 9	1 0	1 7
2 3	2 2	2 4	2 6	2 8	2 7	2 0	2 5	2 9	2 1
3 3	3 1	3 2	3 4	3 8	3 6	3 7	3 9	3 5	3 0
4 2	4 1	4 3	4 5	4 0	4 6	4 8	4 7	4 9	4 4
5 2	5 0	5 3	5 4	5 1	5 6	5 8	5 7	5 9	5 5
6 3	6 2	6 5	6 6	6 4	6 8	6 9	6 0	6 7	6 1
7 1	7 2	7 3	7 4	7 5	7 6	7 7	7 8	7 9	7 0
8 4	8 2	8 1	8 0	8 6	8 7	8 8	8 3	8 9	8 5
9 3	9 4	9 7	9 8	9 0	9 9	9 5	9 2	9 6	9 1

Exercise 9.

1. 1+1= 1+3= $3+$4= 3+5= $3+$6=
2. 2+1= 2+3= $4+$4= 4+5= $6+$3=
3. 1+2= 4+1= $5+$1= 5+4= $6+$4=
4. 2+2= 1+4= $1+$5= 5+5= $4+$6=
5. 3+1= 2+4= $2+$5= 6+1= $5+$6=
6 3+2= 4+2= $5+$2= 1+6= $6+$5=
7. 3+3= 4+3= $5+$3= 2+6= $6+$6=

Exercise 10.

1. Will found 6 (3, 7) eggs in one nest and 2 (6, 5) eggs in another. How many eggs did he find?

2. Rob had 7 (3, 5) marbles and won 2 (7, 5). How many had he then?

3. A man had 2 (7, 5) cows and bought 6 (4, 6). How many had he then?

4. A man sold 2 (4, 7) horses and has 7 (7, 5) horses left. How many horses had he?

5. Jane had 6 (4, 7) cherries and Mary had 3 (6, 4) cherries. How many had the two?

6. Alice has 7 (6, 5) books and Charlie has 3 (6, 6). How many books have the two?

7. There are 4 (7, 7) boys and 6 (6, 7) girls in a class. How many are in the class?

Exercise 11.

Supply the correct number in each blank.

1. 2 and. . . . =5 $3 and. . . . =$5 2+. . . . =5
2. 4 and. . . . =6 $4 and. . . . =$7 3+. . . . =5
3. 3 and. . . . =5 $4 and. . . . =$6 4+. . . . =6
4. 3 and. . . . =7 $3 and. . . . =$6 3+. . . . =6
5. 4 and. . . . =7 $4 and. . . . =$8 5+. . . . =8
6. 2 and. . . . =6 $5 and. . . . =$8 6+. . . . =8
7. 4 and. . . . =8 $3 and. . . . =$7 5+. . . . =9

ADDITION TABLE II.

Adding up and down every possible combination is obtained.

1	1	1	3	1	3	1	3	5	1	3	5	1	3	5	7	1	3	5	7	1	3	5	7	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	9
1	2	2	3	2	4	2	4	5	2	4	6	2	4	6	7	2	4	6	8	2	4	6	8	9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Exercise 12.

How many are :—

1. 1 apple, and 2 apples, and 1 apple, and 2 apples?
2. 2 apples, and 1 apple, and 2 apples, and 1 apple?
3. 2 pins, and 2 pins, and 1 pin, and 2 pins, and 2 pins?
4. 3 pins, and 1 pin, and 3 pins, and 1 pin, and 3 pins?
5. 3 boys, and 2 boys, and 3 boys, and 2 boys, and 3 boys?
6. 2 boys, and 3 boys, and 1 boy, and 2 boys, and 3 boys?
7. 3 boys, and 4 boys, and 2 boys, and 1 boy, and 2 boys?

Exercise 13.

How many are :—

1. 1, and 2, and 1, and 2?
2. 2, and 1, and 2, and 1?
3. 2, and 2, and 1, and 2?
4. 1, and 1, and 2, and 2?
5. 3, and 1, and 3, and 1?
6. 1, and 3, and 1, and 3?
7. 2, and 3, and 2, and 3?

4, and 2, and 1, and 3?
3, and 2, and 1, and 4?
3, and 4, and 3, and 4?
5, and 2, and 3, and 4?
5, and 4, and 3, and 2?
5, and 3, and 4, and 2?
4, and 3, and 2, and 5?

Exercise 14.

1. I bought a sheep for 8 (4, 8) dollars and sold it to gain 2 (8, 3) dollars. How much did I get for it?

2. I sold a lamb for 8 (9, 7) dollars and lost 3 (2, 8) dollars. Find the cost.

3. I gave 8 (8, 9) apples to one boy and 5 (8, 6) to another. How many did I give away?

4. I got 2 (5, 9) oranges from one boy and 8 (8, 4) from another. How many oranges did I get?

5. I spent 3 (9, 2) cents for a slate and 8 (5, 9) cents for a book. How much did the two cost me?

6. I spent 8 (9, 7) cents and lost 4 (3, 9) cents. How much money was gone?

7. I spent 5 (6, 9) dollars and had 8 (8, 8) dollars left. How much money had I at first?

Exercise 15.

How many are :—

1. 1, and 2, and 1, and 2, and 1, and 2, and 1, and 2?
2. 2, and 1, and 2, and 1, and 2, and 1, and 2, and 1?
3. 2, and 2, and 1, and 2, and 2, and 1, and 2, and 2?
4. 3, and 1, and 3, and 1, and 3, and 1, and 3, and 1?
5. 2, and 3, and 2, and 3, and 2, and 3, and 2, and 3?
6. 4, and 3, and 2, and 4, and 3, and 2, and 4, and 3?
7. 5, and 3, and 4, and 5, and 3, and 4, and 5, and 3?

Exercise 16.

1. John had 7 (5, 8) cents, and he earned 5 (4, 6) cents. How much had he then?

2. I had $5 ($8, $3), and my brother gave me $5 ($4, $6). How much had I then?

3. A man gave 6 (9, 5) dollars for a horse and 5 (4, 6) dollars for a cow. Find cost of the two.

4. A class contains 4 (6, 7) girls and 5 (4, 6) boys. How many are there in the class?

5. Will found 9 (3, 6) eggs, and Tom found 5 (4, 6). How many did the two find?

6. One bag contains 8 (4, 9) apples, and another 5 (4, 6) apples. How many are in the two bags?

7. A man travels 3 (7, 4) miles one day, and 5 (4, 6) miles another day. How far did he go in two days?

Exercise 17.

Add vertically—up, or down.
Add horizontally—from left, or right.

1. 1+2+1+2+1+2+1=   3+3+2+2+3+3+2=
2. 2+1+2+1+2+1+2=   2+2+3+2+2+3+2=
3. 1+1+2+1+1+2+1=   2+3+2+3+2+3+2=
4. 2+2+1+2+2+1+2=   3+2+3+2+3+2+3=
5. 2+2+1+1+2+2+1=   4+2+3+4+2+3+4=
6. 3+2+1+3+2+1+3=   3+4+2+3+4+2+3=
7. 1+2+3+1+2+3+1=   3+5+4+3+5+4+3=

— — — — — — —   — — — — — — —

Exercise 18.

1.	2+1=	12+1=	22+1=	32+1=	52+1=
2.	3+2=	13+2=	23+2=	43+2=	63+2=
3.	3+3=	23+3=	33+3=	53+3=	73+3=
4.	3+4=	[illegible]4=	43+4=	73+4=	53+4=
5.	4+4=	[illegible]4=	24+4=	34+4=	94+4=
6.	5+3=	25+3=	15+3=	85+3=	45+3=
7.	5+4=	15+4=	25+4=	45+4=	75+4=

Exercise 19.

1.	6+4=	16+4=	26+4=	46+4=	86+4=
2.	7+3=	17+3=	37+3=	57+3=	77+3=
3.	5+6=	25+6=	35+6=	45+6=	65+6=
4.	8+4=	28+4=	38+4=	88+4=	78+4=
5.	9+3=	19+3=	29+3=	49+3=	79+3=
6.	4+7=	14+7=	24+7=	64+7=	44+7=
7.	3+8=	33+8=	23+8=	53+8=	33+8=

Exercise 20.

1.	9+4=	19+4=	29+4=	39+4=	49+4=
2.	7+5=	27+5=	17+5=	37+5=	67+5=
3.	8+6=	28+6=	38+6=	58+6=	78+6=
4.	9+7=	19+7=	39+7=	29+7=	59+7=
5.	7+6=	17+6=	27+6=	47+6=	37+6=
6.	6+6=	16+6=	26+6=	36+6=	86+6=
7.	7+8=	27+8=	47+8=	57+8=	77+8=

Exercise 21.

1.	3+7=	13+7=	33+7=	43+7=	93+7=
2.	7+7=	17+7=	27+7=	87+7=	97+7=
3.	9+6=	19+6=	29+6=	59+6=	99+6=
4.	8+8=	18+8=	48+8=	78+8=	98+8=
5.	5+9=	15+9=	95+9=	65+9=	85+9=
6.	9+8=	19+8=	49+8=	59+8=	99+8=
7.	9+9=	19+9=	69+9=	79+9=	99+9=

Exercise 22.

Add vertically—up, or down.
Add horizontally—from left, or right.

1. 1+1+2+1+1+2+1+1+2+1+1+2+1=
2. 1+2+1+2+1+2+1+2+1+2+1+2+2=
3. 2+2+1+2+2+1+2+2+1+2+2+1+2=
4. 3+2+1+3+2+1+3+2+1+3+2+1+3=
5. 3+2+3+2+3+2+3+2+3+2+3+2+2=
6. 3+4+2+4+3+4+2+4+3+4+2+4+4=
7. 5+3+4+5+3+4+5+3+4+5+3+4+5=

Exercise 23.

1. What two numbers are equal to 4? 5? 9?

2. In what ways could a man put 3 (6, 9) pigs into two pens?

3. In what ways could Charlie share 7 (8, 10) apples with his little sister?

4. Show all the ways in which 5 (9, 6) apples could be divided between two boys.

5. Two men earned $8 ($11, $16). How much did each man earn? Give every answer possible.

6. The sum of two numbers is 8 (9, [illegible]). What are they?

7. The master asked James 5 (6, 10) questions. How many did he miss? How many did he answer?

Exercise 24.

Read these questions, filling the blanks properly :—

1. $7+$4= $5+....=$12.   ....+3=10.
2. $8+$3= $7+....=$12.   ....+5=10.
3. $6+$5= $9+....=$12.   ....+8=10.
4. $9+$2= $2+....=$12.   ....+6=10.
5. $6+$7= $8+....=$12.   ....+4=10.
6. $9+$4= $6+....=$12.   ....+7=10.
7. $8+$5= $4+....=$12.   ....+9=10.

Exercise 25.

How many are :—

1. 3 hens and 4 hens? 6 men and 5 men?
2. 7 pears and 3 pears? 9 cats and 3 cats?
3. 6 books and 4 books? 3 dogs and 8 dogs?
4. 5 cents and 2 cents? 5 pins and 5 pins?
5. 8 hats and 3 hats? 8 desks and 6 desks?
6. 4 pens and 5 pens? 7 slates and 4 slates?
7. 9 cows and 5 cows? 4 mice and 9 mice?

Exercise 26.

1. James had 4 (7, 3) apples, and got 7 (8, 9). How many had he then?

2. Will had 6 (4, 8) cents, and found 7 (8, 9). How much money had he then?

3. Rob had $8 ($3, $7), and earns $7 ($8, $9). How much money has he now?

4. Tom had 5 (8, 9) peaches, and buys 7 (8, 9). How many has he now?

5. John had 9 (6, 4) marbles and won 7 (8, 9). How many had he then?

6. I spent $7 ($9, $5), and have $7 ($8, $9) left. How much money had I at first?

7. I answered 3 (5, 6) questions, and missed 7 (8, 9). How many were asked?

Exercise 27.

How many are :—

1. 9 pencils and 4 pencils? 6 knives and 6 knives?
2. 8 apples and 5 apples? 5 bands and 7 bands?
3. 7 pears and 5 pears? 7 cars and 7 cars?
4. 6 caps and 9 caps? 8 rails and 9 rails?
5. 3 books and 6 books? 9 roses and 6 roses?
6. 5 pages and 8 pages? 4 forks and 7 forks?
7. 4 squares and 6 squares? 8 cups and 4 cups?

Exercise 28.

Add vertically—up, or down.

Add horizontally—from left, or right.

1. 4+8+3+5+9+6+7+2+3+9=
2. 7+3+6+8+2+5+4+9+4+6=
3. 8+5+7+2+6+3+9+4+8+2=
4. 3+2+9+4+8+7+5+6+5+7=
5. 9+4+2+6+7+8+3+5+6+3=
6. 5+7+8+9+4+2+6+3+7+4=
7. 6+9+4+7+5+9+8+4+9+5=

Exercise 29.

1. John has $300 ($400, $600), and Mary has $200 ($500, $300). How much money have the two?

2. I paid $200 ($400, $300) for a lot, and $900 ($700, $800) for a house. Find the cost of both.

3. A man has 3,000 (4,000, 5,000) acres of land, and his son has 2,000 (3,000, 6,000) acres. How much land have the two?

4. Will ate 3 (4, 5) half-apples, and Charlie ate 5 (6, 7) half-apples. How many did the two eat?

5. Rob has 5 (7, 9) quarter-dollars, and Sam has 8 (6, 7) quarter-dollars. How much money have the two?

6. I paid 7 (4, 9) half-dollars for a hat, and 3 (8, 6) half-dollars for a cane. Find the cost of both.

Exercise 30.

1. Begin at 1 (2) and add by 2's till you pass 50.
2. Begin at 1 (2, 3) and add by 3's till you pass 60.
3. Begin at 1 (2, 3) and add by 4's till you pass 80.
4. Begin at 1 (3, 4) and add by 5's till you pass 100.
5. Begin at 1 (2, 5) and add by 6's till you pass 100.
6. Begin at 2 (4, 5) and add by 7's till you pass 100.
7. Begin at 3 (5, 7) and add by 8's till you pass 100.

Exercise 31.

1.	23+21=	32+35=	63+35=	43+52=
2.	24+22=	50+36=	24+73=	36+21=
3.	23+33=	45+52=	63+33=	41+37=
4.	32+35=	43+35=	28+71=	24+34=
5.	35+33=	58+40=	34+45=	26+42=
6.	32+37=	26+53=	73+24=	37+52=
7.	43+34=	34+62=	65+34=	33+46=

Exercise 32.

1.	35+35=	28+32=	35+36=	24+39=
2.	25+45=	63+27=	28+33=	36+28=
3.	65+25=	57+33=	45+37=	35+[illegible]
4.	34+36=	28+62=	28+36=	45+28=
5.	43+37=	39+21=	35+55=	38+45=
6.	36+34=	61+29=	35+49=	63+29=
7.	37+53=	47+43=	63+28=	35+39=

Exercise 33.

1.	68+93=	76+39=	57+37=	75+89=
2.	75+86=	58+67=	76+92=	48+79=
3.	96+37=	35+86=	67+87=	38+95=
4.	59+74=	67+94=	69+38=	47+65=
5.	63+89=	38+87=	89+66=	87+78=
6.	76+98=	66+86=	73+88=	68+88=
7.	84+99=	78+96=	64+87=	87+49=

Exercise 34.

1.	247+326=	528+659=	857+629=
2.	435+228=	837+645=	375+842=
3.	637+249=	744+829=	937+685=
4.	526+354=	656+927=	738+594=
5.	365+247=	979+336=	684+486=
6.	459+238=	435+848=	379+985=
7.	324+637=	846+548=	594+738=

Exercise 35.

1. I spent 3 (6, 5) five-cent pieces, and 4 (3, 5) five-cent pieces. How much did I spend?

2. I gave Will 4 (3, 6) ten-cent pieces, and John 5 (6, 5) ten-cent pieces. How much did I give away?

3. I have 5 (3, 7) $2 bills in one hand, and 3 (5, 4) $2 bills in the other. How much money have I?

4. I gave 4 (6, 8) ten-dollar bills for a cow, and 7 (4, 3) ten-dollar bills for a horse. Find cost of both.

5. A has 7 (8, 9) two-acre fields. B has 3 (4, 5) two-acre fields. How much land have they?

6. I sold 7 (9, 8) five-acre fields, and have yet 5 (4, 5) five-acre fields. How much land have I?

7. Will picked 6 (7, 6) 4-quart baskets of cherries and 7 (8, 9) 4-quart baskets of cherries. How much did he pick?

Exercise 36.

1. John has 3 (4, 5) cents. Will has 4 (6, 5) cents more than John. How much has Will?

2. John has 4 (8, 9) cents. Rob has 5 (4, 6) cents more than John. How much have the two?

3. Tom spent 6 (7, 8) cents for a pen, and 5 (9, 6) cents for a book. Find the cost of the two.

4. Alice is 7 (8, 4) years old. Charlie is 7 (6, 9) years older. Find the sum of their ages.

5. One hen has 8 (6, 5) white chicks, and 5 (7, 4) black ones. How many chicks has the hen?

6. One hen has 9 (6, 7) chicks, and another has 7 (8, 9) more. How many chicks are in the two broods?

7. One farmer has 9 (8, 6) bags of wheat, and another has 9 (8, 6) more. How many have the two?

Exercise 37.

1. 6 (17, 24) boys and 7 (18, 28) girls=
2. 5 (13, 27) roses and 8 (18, 24) pansies=
3. 8 (16, 26) cows and 6 (14, 23) sheep=
4 5 (15, 29) grammars and 9 (18, 28) readers=
5. 7 (17, 34) pears and 5 (19, 27) peaches=
6. 9 (12, 35) lilacs and 6 (19, 36) tulips=
7. 6 (17, 28) robins and 5 (16, 47) larks=

Exercise 38.

Secure the necessary coins, and count out the change for the following instances :—

1. 75c., 50c., 25c., 80c., 70c., 60c., 40c., from $1.
2. 30c., 20c., 10c., 15c., 35c., 45c., 55c., from $1.
3. 48c., 43c., 39c., 37c., 67c., 84c., 13c., from $1.
4. 21c., 27c., 16c., 9c., 28c., 32c., 98c., from $2.

Write down the words you would say as you count out this change.

Write down, in order, the names of the coins you would give out.

Exercise 39.

1. How much land in two fields, each 6 (7, 9) acres?

2. How much will three lambs cost, at 4 (5, 8) dollars each?

3. How much berries are put into three cans, if 6 (9, 7) quarts are put into each?

4. How many pupils are in three classes, if there are 3 (4, 6) boys, and 5 (8, 7) girls, in each class?

5. How many apples on four plates, if there are 3 (4, 5) red apples, and 4 (6, 5) green apples on each?

6. How many sheep in 3 fields, if each contains 12 (15, 17) black sheep, and 8 (15, 28) white ones?

7. I have 3 (4, 7) $2 bills in one hand, and 5 (6, 8) $4 bills in the other. How much money is that?

Exercise 40.

1. John read 10 (18, 13) pages and James read 10 (12, 16) pages. How many did the two read?

2. A man sold 12 (17, 18) sheep on Monday and 11 (14, 15) sheep on Tuesday. How many did he sell?

3. I bought 14 (16, 17) sheep from one man and 11 (15, 17) sheep from another. How many did I buy?

4. Rob has 16 (19, 14) five-cent pieces. Harry has 11 (12, 16) five-cent pieces. How much money have the two boys?

5. Will has 13 (16, 18) ten-cent pieces. Tom has 12 (16, 18) ten-cent pieces. How much money have they together?

6. I have 13 (19, 16) 5-acre fields and you have 14 (14, 19) 5-acre fields. How much land have we?

7. I have 17 (19, 16) dozen eggs after selling 13 (13, 18) dozen eggs. How many eggs had I at first?

Exercise 41.

1. A farmer sold a load of oats for $24 ($43, $45), and a load of wheat for $33 ($34, $52). How much did he get for the two?

2 A man had $65 ($28, $24) in the bank. and put in $24 ($71, $34). How much had he in the bank then?

3. I am 22 (43, 28) years of age, and my father is 23 (35, 33) years older. Find my father's age.

4. One book cost 45 (71, 32) cents, and another cost 24 (28, 35) cents. Find cost of the two.

5. One load contains 42 (63, 54) bushels, and another 35 (33, 25). How many bushels in the two?

6. After selling 27 (58, 39) sheep, I have 62 (40, 60) sheep left. How many had I at first?

7. I sold 46 (32, 59) yards of cloth on Monday, and 53 (47, 30) on Tuesday. How many yards did I sell?

Exercise 42.

1. Alice is 6 (7, 9) years old, and Will is 8 (9, 11). Find the sum of their ages in 4 years.

2. The sum of Will's age and Mary's, is 9 (11, 16) years. What will be the sum of their ages in 5 years?

3. Will has 3 span of horses, Rob has 2 span, and Sam has 4 span. How many horses have the three?

4. Charlie has 2 (3, 4) ten-cent pieces, 3 (4, 3) five-cent pieces, and 2 (3, 4) coppers. How much money has he?

5. Sam lives 1 (2, 2) mile from school, and Rob 3 (2, 1) miles from school. How far must they walk each day?

6. I paid 9 (7, 6) cents for a slate, 6 (8, 6) cents for a pen, and as much as both for a book. Find the cost of all.

7. How long a fence will be needed for a lot 8 (7, 9) rods long and 7 (6, 8) rods wide?

Exercise 43.

1. Sam was absent from school 2 days in one week, 4 days in another, and 1 in another. How many days was he present?

2. I pay $6 ($9, $8) for a sheep, and $3 ($4, $5) for feed. Find the selling price to gain $3 ($6, $9).

3. Find the sum of the numbers ending in 3, 4 and 5 between 20 and 30; 30 and 40; 50 and 60.

4. Find the sum of the numbers less than 30 which end in 3 (4, 6).

5 What is the sum of the numbers ending in 5 (8, 9), between 30 and 50? 60 and 80? 40 and 70?

6. A boy shot an arrow 25 (36, 48) yards up the road. How far must his brother go to fetch it for him?

7. Find the sum of the odd numbers between 20 and 30.

SUBTRACTION.

Subtraction is the process of finding the difference between two numbers of the same kind.

The Subtrahend is the number which is to be subtracted.

The Minuend is the number from which the other number is to be subtracted.

The Remainder or **Difference** is the number which is found when one number is subtracted from another.

– **(Minus)** is the sign of subtraction, and, when placed between two numbers, it means that the second number is to be taken from the first.

6 – 2 = 4, is read, "six minus two, equals four."

Exercise 44.

1. Will had 2 (3, 8) apples, and gave Tom 1. How many had he then?

2. Rob had 4 (7, 9) cents, and spent 1. How many had he left?

3. John had 1 (5, 6) sheep, and he sold one. How many has he now?

4. A boy had 3 (5, 7) marbles, and he lost 2. How many had he then?

5. A girl had 4 (6, 9) cents, and she gave me 2 cents. How much money had she then?

6. From 2 (8, 11) cents, I saved 2 cents. How much did I spend?

7. I earned $5 ($9, $6), and spent $3. How much did I save?

Exercise 45.

1. $5 – $2 =   3 – 3 = $9 – $4 =   8 – 5 = $7 – $4 =
2. $8 – $2 =   7 – 3 = $4 – $4 =   6 – 5 = $6 – $5 =
3. $4 – $2 =   6 = 3 = $5 – $4 =   4 – 5 = $5 = $3 =
4. $6 – $2 =   5 – 3 = $3 – $4 =   7 – 5 = $4 – $2 =
5. $3 – $2 =   4 – 3 = $7 – $4 =   3 – 5 = $9 – $5 =
6. $7 – $2 =   9 – 3 = $8 – $4 =   5 – 5 = $3 – $2 =
7. $9 – $2 =   8 – 3 = $6 – $4 =   9 – 5 = $8 – $4 =

Exercise 46.

What is the difference between : –

1.	9 and 3?	$8 and $4?	$5 and $4?	6 and 5?
2.	7 and 4?	$7 and $3?	$8 and $3?	9 and 3?
3.	5 and 8?	$6 and $9?	$7 and $9?	3 and 7?
4.	4 and 9?	$5 and $7?	$9 and $1?	5 and 9?
5.	6 and 7?	$3 and $5?	$4 and $3?	8 and 2?
6.	2 and 5?	$9 and $8?	$3 and $6?	7 and 8?
7.	8 and 6?	$4 and $6?	$6 and $2?	4 and 4?

Exercise 47.

1. I had 8 apples, and gave away 6 (3, 5). How many had I left?

2. I had 9 (8, 5) cherries, and gave away 4. How many had I left?

3. I had 9 (12, 11) chicks, and 5 (8, 3) died. How many were still alive?

4. Rob gave a ten-cent piece to pay for 5 (8, 9) cents' worth of dates. How much change should he get?

5. How many legs has a fly more than a sheep? A spider than a bird? A wasp than a bee?

6. George had 5 (7, 3) marbles. He won 4 (3, 7) and lost 2 (4, 6). How many had he then?

7. A man had $15 ($36, $43). How often could he give away $3 ($5, $8)?

Exercise 48.

1. How much is 7 greater than 2? 4? 3? 5? 6?
2. What must be added to 5, to make 8? 7? 5? 9? 10?
3. What must be taken from 10, to leave 7? 8? 6? 5? 4? 9?
4. By how much does 9 exceed 5? 7? 8? 3? 6? 4?
5. How much can I spend from $7 and have $3? $6? $4? $5?
6. What remains after taking 4, as often as possible, from 9? 11? 17? 25?
7. Take 6 as often as possible from 13, 17, 26, [illegible] 50, 75.

8 - 3 - 21

15 - 3

SUBTRACTION TABLE.

Subtract at sight, or as the teacher points.

2	1	4	3	8	6	9	7	5	10
1	1	1	1	1	1	1	1	1	1
2	3	6	4	7	10	8	5	9	11
2	2	2	2	2	2	2	2	2	2
3	5	4	6	9	8	11	7	12	10
3	3	3	3	3	3	3	3	3	3
5	4	8	10	7	6	9	12	11	13
4	4	4	4	4	4	4	4	4	4
5	8	6	11	13	9	10	14	7	12
5	5	5	5	5	5	5	5	5	5
9	12	15	11	7	10	6	8	13	14
6	6	6	6	6	6	6	6	6	6
7	10	14	9	16	12	15	8	11	13
7	7	7	7	7	7	7	7	7	7
8	11	16	13	10	14	15	17	9	12
8	8	8	8	8	8	8	8	8	8
9	10	12	14	16	18	11	13	15	17
9	9	9	9	9	9	9	9	9	9

Exercise 49.

1. How much is 80 greater than 40? 60? 30? 50? 20?
2. What number added to 30, will make 50? 70? 60?
3. What remains, when $50 is taken from $60? $100?
4. What must be added to $40, to make $70? $100?
5. How much is [illegible] less than 30? 60? 90? 80? 100?
6. How much is 300 less than 500? 800? 700? 1000?
7. How much is $900 greater than $400? $700? $500?

Exercise 50.

1. A boy had 7 (8, 6) five-cent pieces, and spent 3 (7, 4) five-cent pieces. How much money had he then?

2. A man had 9 (7, 6) ten-acre fields, and sold 5 (4, 3) ten-acre fields. How much land had he left?

3. A girl found 8 (5, 4) dozen eggs, and sold 5 (2, 3) dozen. How many eggs had she left?

4. A man earned 9 (8, 7) ten-dollar bills, and spent 6 (3, 6) ten-dollar bills. How much did he save?

5. Will had 9 (8, 10) ten-cent pieces, and lost 7 (6, 5) ten-cent pieces. How much money had he left?

6. Charlie had 7 (8, 11) half-apples, and gave 6 (5, 8) half-apples to Will. What had he left?

7. Will had 8 (9, 12) quarter-dollars, and spent 7 (6, 9) quarter-dollars. How much money had he then?

Exercise 51.

1. What number added to 4, will make 7? 9? 6? 8? 10?
2. How many taken from 9, will leave 6? 8? 5? 2? 4?
3. Take 5 from 8, 7, 9, 6, 11, and 13.
4. From 8, take 4, 7, 3, 5, 6, and 2.
5. What two numbers are equal to 9? 8? 5? 6? 10?
6. To make 10, how much must be added to 4? 7? 9? 3? 5?
7. Subtract by 2's (3's, 4's) from 6, 8, 9, 7, 5, and 10.

Exercise 52.

1. James earned 5 (8, 7) cents, and spent 3 (6, 5) cents. How much had he left?

2. Bob earned 3 (4, 6) cents, and saved 2 (2, 5) cents. How much money did he spend?

3. Will spent 8 (7, 10) cents, and saved 5 (4, 5) cents. How much money did he earn?

4. Walter earned 7 (3, 5) cents a week, and spent all but 2 (3, 2) cents. How much did he spend?

5. Tom earned 6 (9, 8) cents a day, and saved all but 4 (3, 7) cents. How much did he spend?

6. Charlie earned 9 (5, 9) cents a week, and saved all but 6 (4, 7) cents. How much did he save?

7. Mary had 4 (10, 6) cents, and lost all but 3 (6, 3) cents. How much had she left?

Exercise 53.

1. I bought a pen for 5 (8, 4) cents, and sold it for 7 (10, 9) cents. Find my gain.

2. I paid 10 (7, 9) cents for a book, and sold it for 6 (3, 5) cents. Find my loss.

3. I gave $9 ($6, $11) for a sheep, and sold it for $7 ($11, $8). Find my loss or gain.

4. I got $9 ($8, $11) for a coat that cost $6 ($3, $14). Find my loss or gain.

5. By selling a slate for 9 (12, 16) cents, I lost 2 (5, 7) cents. Find the cost.

6. By selling a book for 100 (150, 180) cents, I gained 40 (90, 60) cents. Find the cost.

7. I bought two books for 5 (8, 12) cents, and sold them for 9 (14, 20) cents. Find the gain, or loss, on each.

Exercise 54.

1. A man owed $600 ($800, 500), and paid $300 ($400, $200). How much does he still owe?

2. I bought a lot for $800 ($600, $900), and paid $500 ($200, $400). How much is unpaid?

3. I bought a house for $1000, and still owe $300 ($600, $400). How much have I paid?

4. I paid $6000 ($7000, $3000) for a farm, and sold it for $7000 ($9000, $7000). Find my gain.

5. I paid $6000 ($7000, $9000) for a house, and sold it for $3000 ($6000, $6000). Find the loss.

6. I paid 200 (500, 400) cents for a book, and sold it for 700 (500, 700) cents. Find my loss, or gain.

7. I got $400, ($500, $1000) for a horse that cost me $300. Find my gain, or loss.

Exercise 55.

1. James has 9 (11, 8) cents, and Rob has 6 (5, 4) cents less. How many cents has Rob?

2. Sarah has 7 (6, 4) dollars, and Alice has 5 (4, 3) dollars less. How much money have the two?

3. One sheep cost $10 ($9, $6), and another cost $5 ($4, $5). Find the difference in their price.

4. There are 12 (11, 14) colts in one field, and 7 (8, 7) less in another. How many colts are in the two fields?

5. John has $700 ($500, $4,000) in one bank, and $300 ($200, $1,000) less in another. How much has he in the bank?

6. I paid 9 (8, 12) ten-cent pieces for one book, and 4 (3, 5) ten-cent pieces less for another. Find the cost of both.

7. I gave 8 (9, 10) $10-bills for a horse, and 3 (5, 2) $10-bills less, for a cow. Find cost of both.

Exercise 56.

1. Take 1 (3, 2) from 4, 14, 24, 34, 44, 64, 84.
2. Take 3 (2, 4) from 5, 15, 25, 45, 65, 75, 95.
3. Take 4 (3, 2, 5) from 7, 17, 27, 57 37, 87, 67.
4. Take 5 (3, 4, 6) from 8, 18, 28, 38, 78, 68, 98.
5. Take 6 (3, 5, 4) from 9, 19, 29, 89, 69, 49, 99.
6. Take 8 (7, 6, 9) from 5, 15, 25, 45, 65, 75, 85.
7. Take 9 (7, 8, 10) from 6, 16, 26, 86, 96, 46, 96.

Exercise 57.

1. A man has 4 sons, in a family of 7 (9, 11). How many daughters has he?

2. How many girls are in a class of 8, if 3 (4, 7) of the class are boys?

3. How many boys are in a class of 12, if 5 (8, 9) are girls?

4. How many girls are in a class of 18 (25, 31), if 14 are boys?

5. How many boys are in a class of 29 (35, 40), if 16 are girls?

6. There are 18 girls in a class of 31 (35, 43). How many boys are in the class?

7. A man has 4 sons, and each son has 3 sisters. How many children has the man?

Exercise 58.

Tell a story about :—

1.	3 cents + 4 cents.	5 cents − 2 cents.	\$90 + \$60.
2.	5 men + 2 men.	8 lambs − 4 lambs.	\$70 − \$30.
3.	8 eggs + 5 eggs.	7 flowers − 5 flowers.	\$80 + \$40.
4.	6 nests + 3 nests.	9 colts − 3 colts.	\$60 − \$20.
5.	7 boys + 6 boys.	6 eggs − 4 eggs.	\$50 − \$40.
6.	4 girls + 7 girls.	5 days − 3 days.	\$40 + \$50.
7.	9 sheep + 8 sheep.	7 days − 2 days.	\$80 − \$50.

Exercise 59.

Write the successive remainders when taking :—

1. 2, as often as possible, from 11, 20, 45, 50.
2. 3, as often as possible, from 15, 32, 46, 60.
3. 4, as often as possible, from 24, 45, 62, 83.
4. 5, as often as possible, from 30, 56, 67, 93.
5. 6, as often as possible, from 42, 49, 74, 87.
6. 7, as often as possible, from 56, 64, 87, 96.
7. 8, as often as possible, from 64, 74, 85, 99.

Exercise 60.

1. In a class, there are 9 (11, 14) girls, and 4 (5, 6) boys. How many are in the class?

2. There are 7 (9, 8) boys in class of 12 (15, 11). How many girls are in the class?

3. In a class of 8 (11, 15), there are 2 (3, 3) more girls than boys. How many boys are in the class?

4. In a class of 9 (11, 12), there are 3 (5, 4) fewer girls than boys. How many of each are in the class?

5. Two houses cost $900 (700, $800). One cost $100 ($300, $200) more than the other. Find cost of each.

6. I paid $800 ($900, $1000) for a span of horses. One cost $200 ($300, $200) more than the other. Find cost of each.

7. A horse cost $6 ($36, $75) more than a cow, and both cost $106 ($236, $495). Find cost of each.

Exercise 61.

1. 168 – 25. $237 – $125. $469 – $234. 483 – 241.
2. 283 – 42. $358 – $237. $783 – $322. 765 – 354.
3. 275 – 32. $367 – $253. $975 – $435. 934 – 623.
4. 276 – 65. $584 – $322. $483 – $312. 857 – 415.
5. 387 – 54. $296 – $145. $628 – $206. 696 – 622.
6. 497 – 32. $375 – $372. $247 – $125. 379 – 237.
7. 386 – 45. $584 – $282. $538 – $306. 548 – 420.

Exercise 62.

1. Will is [illegible] (10, 7) years old, and Alice is 3 (5, 4) years younger. Find Alice's age.

2. Rob is 7 (9, 10) years old, and Mary is 5 (6, 4) years younger. Find the sum of their ages.

3. Charlie is 12 (11, 14) years old, and Alice is 6 (7, 8) years younger. Find the difference in their ages.

4. The sum of the ages of two boys is 15 (16, 18(years. One is 6 (9, 8). Find the age of the other.

5. The sum of the ages of two girls is 9 (11, 15) years. One is 3 years older than the other. Find age of each.

6. The sum of two numbers is 8 (10, 17). Their difference is 2 (4, 5). Find the numbers.

7. How much is the sum of 6 (8, 15) and 9 (7, 10) greater than their difference?

Exercise 63

1. A man can row 4 (5,8) miles an hour, in still water. How far can he row in an hour, down a stream running 2 (3, 5) miles an hour?

2. A man can row 8 (9, 12) miles an hour, in still water. How far can he go in an hour, up a stream running at the rate 2 (4, 5) miles an hour?

3 A man can row 6 (8, 9) miles an hour, in still water, and 8 (12, 12) miles an hour, down stream. How fast is the stream running?

4. A man can row 9 (10, 12) miles an hour in still water, and 8 (7, 10) miles an hour, up stream. Find the rate of the stream.

5. I row up stream at the rate of 5 (7, 8) miles an hour, and 7 (11, 14) miles an hour, down stream. Find the rate of the stream.

6. I row 8 (9, 12) miles an hour, down stream, and 6 (5, 6) miles an hour, up stream. Find rate in still water.

7. A man rows 12 (16, 20) miles an hour, down stream, and 8 (10, 14) miles an hour, up stream. Find the difference between the rate of the stream, and the rate of the man in still water.

Exercise 64.

Fill the blanks properly :—

1. 3+....=4. $9 - $5 = ...-4=8.
2. 4+....=8. $8 - $6 = ...-5=6.
3. 5+....=6. $6 - $4 = ...-8=9.
4. 8+....=10. $7 - $3 = ...-6=10.
5. 6+....=9. $5 - $3 = ...-3=7
6. 2+....=5. $3 - $2 = ...-7=11.
7. 7+....=7. $4 - $4 = ...-9=12.

Exercise 65.

1. 30+....=70. $500+....=$800.   50+....=90.
2. 20+....=50. $400+....=$900.   50+....=190.
3. 40-....=30. $300+....=$700.   50+....=390.
4. 80+....=90. $800-....=$400.   50+....=290.
5. 70-....=20. $900-....=$500.   50+....=590.
6. 90-....=40. $700-....=$600.   50+....=790.
7. 60+....=80. $800-....=$300.   50+....=890.

Exercise 66.

1. 3+....=9.   5+....=8.   7-....=4.
2. 3+....=19.   5+....=18.   27-....=14.
3. 3+....=29.   5+....=48.   47-....=34.
4. 3+....=49.   5+....=78.   37-....=24.
5. 3+....=69.   5+....=68.   67-....=34.
6. 3+....=89.   5+....=38.   89-....=54.
7. 3+....=59.   5+....=98.   57-....=44.

Exercise 67.

Fill the blanks properly :—

	Minuend.	Subtrahend.	Remainder.
1.	9 (12, 21)	5 (6, 16)	....
2.	8 (14, 38)	4 (8, 25)	....
3.	....	9 (12, 28)	7 (8, 32).
4.	....	7 (10, 36)	8 (12, 37).
5.	12 (20, 35)	....	9 (14, 29).
6.	15 (30, 42)	....	6 (13, 34).
7.	$9 ($15, $28)	$7 ($8, $19)	....

Exercise 68.

Read the successive remainders as quickly as possible.

1. 54 − 3 − 2 − 4 − 5 − 6 − 7 − 2 − 3 − 4 − 7 − 4 − 2 =
2. 63 − 2 − 3 − 4 − 2 − 7 − 5 − 4 − 5 − 4 − 5 − 6 − 8 =
3. 68 − [illegible] − 4 − 6 − 5 − 2 − 7 − 6 − 4 − 8 − 2 − 5 − 9 =
4. 75 − 6 − 8 − 4 − 5 − 9 − 8 − 9 − 6 − 2 − 4 − 3 − 5 =
5. 83 − 4 − 7 − 8 − 6 − 9 − 9 − 4 − 5 − 5 − 6 − 2 − 8 =
6. 85 − 9 − 4 − 9 − 6 − 3 − 4 − 5 − 6 − 7 − 2 − 5 − 6 =
7. 76 − 5 − 4 − 6 − 9 − 3 − 8 − 8 − 8 − 6 − 6 − 5 − 4 =

Exercise 69.

1. The sum of three numbers is 9 (12, 16). Two of the numbers are 2 (3, 2) and 3 (4, 5). Find the other.

2. Three books cost $10 ($12, $16). One cost $2 ($6, $5). Another cost $5 ($4, $4). Find the cost of the third.

3. The sum of the ages of three girls is 14 (16, 19) years. One is 5 (3, 6); another is 4 (8, 7). Find age of the third.

4. A, B and C bought a boat for $20 ($25, $30). A paid $7 ($9, $8). B paid $8 ($6, $12). What did C pay?

5. Sam won 12 (15, 18) marbles from A, B, and C. He won [illegible] (8, 9) from A, and 5 (3, 4) from B. How many from [illegible]

6. Give all the ways 7 (9, 11) apples could be divided among three boys, A, B and C, each getting some.

7. Give all the ways Walter could share 6 (8, 10) peaches with Alice and Willie.

Exercise 70.

Read the successive answers as quickly as possible.

1. 8 + 4 − 3 − 5 + 6 − 3 + 7 + 6 − 3 − 4 + 5 − 8 + 6 − 7 =
2. 5 + 6 − 5 + 2 − 8 + 7 + 8 − 4 − 5 + 7 − 9 + 4 − 5 + 7 =
3. 3 + 5 − 2 + 3 + 6 − 5 + 8 − 7 − 4 + 9 2 − 5 − 6 + 9 =
4. 9 + 3 − 6 + 7 − 5 − 6 + 9 − 4 + 5 − 4 − 7 + 8 + 9 − 3 =
5. 6 + 7 − 4 + 9 − 8 − 6 + 7 + 9 − 6 − 6 − 6 + 7 − 5 + 8 =
6. 4 + 9 − 7 + 6 + 8 − 7 − 6 + 5 + 8 − 10 − 6 + 9 − 7 + 6 =
7. 7 + 8 − 9 + 8 − 7 + 8 − 4 + 8 − 6 + 8 − 9 − 9 + 8 − 6 =

Exercise 71.

1. 305 – 68 =	$906 – $247 =	304 – 186 =
2. 207 – 89 =	$703 – $325 =	409 – 164 =
3. 304 – 57 =	$805 – $267 =	602 – 325 =
4. 203 – 64 =	$206 – $128 =	504 – 267 =
5. 504 – 36 =	$508 – $349 =	607 – 328 =
6. 602 – 45 =	$407 – $288 =	400 – 175 =
7. 507 – 79 =	$605 – $386 =	500 – 386 =

Exercise 72.

1. Find the gain or loss in buying for $6 ($15, $ 3), and selling for $9 ($12, $28).

2. Divide 8 (16, 23) apples between two boys, giving one of them 3 (9, 16) apples.

3. James has 8 (45, 64) cents, and Rob has 11 (37, 89). Which has the more, and how much?

4. There were 9 (34, 43) boys in a class, and 6 (18, 27) of them were promoted. How many remained?

5. Mary had 9 (24, 32) chickens, and 4 (17, 18) died. How many had she left?

6. A man borrowed $9 ($35, $75), and has paid back $5 ($16, $29). How much does he still owe?

7. I lent a man $9 ($33, $45), and got back $3 ($19, $29). How much is still due me?

Minuend	245	259	....	325	436	....	365
Subtrahend	173	....	168	183	....	258	197
Difference	....	164	173	....	287	396	....

Exercise 73.

1. 196 – 37 =	$263 – $84 =	237 – 63 =
2. 245 – 28 =	$354 – $69 =	343 – 85 =
3. 254 – 39 =	$275 – $96 =	426 – 59 =
4. 265 – 38 =	$286 – $99 =	331 – 68 =
5. 396 – 85 =	$364 – $75 =	325 – 47 =
6. 263 – 46 =	$283 – $68 =	234 – 85 =
7. 254 – 37 =	$465 – $96 =	237 – 89 =

Exercise 74.

How many days are in :—

1. May? January? September? December?
2. July? April? February? October?
3. August? June? November? March?
4. July and August? September and October?
5. March and April? July and December?
6. November and Dec.? February and November?
7. May and June? May and December?

Exercise 75.

1. James had 14 (36, 76) marbles, and gave Rob 5 (9, 24), and Will 3 (8, 26). How many had he left?

2. I had 15 (47, 64) lambs, and sold 6 (11, 25) to one man, and 5 (12, 24) to another. How many had I left?

3. A man lent $16 ($80, $100) and got back $5 ($25, $36) at one time, and $7 ($35, $24) at another. How much is still due?

4. A had 18 (43, 64) acres of land, and sold 5 (18, 25) acres to B, and 6 (17, 16) acres to C. How much had he left?

5. The sum of three numbers is 34 (87, 96). One is 8 (21, 33). Another is 7 (39, 23). Find the third.

6. I gave $25 ($45, $83) for three sheep. One cost $8 ($16, $26). A second cost $9 ($19, $27). Find the cost of the third.

7. I bought a cow for $17 ($53, $85), and paid $9 ($16, $19), and $5 ($17, $26). How much is still due?

Exercise 76.

How many days are in :—

1. Feb., March, and April? May, March, and July?
2. Aug., Sept., and Oct.? June, Oct., and April?
3. May, June, and July? Jan., April, and May?
4. Nov,, Dec., and Jan.? Aug., June, and March?
5. First 3 months of year? The last 3 months?
6. The second quarter? The third quarter?
7. The first half of year? The second half of year?

Exercise 77.

How many days in the month after :—

1. November 5? 7? 9? 11? 16? 19? 25? 30?
2. July 4? 6? 12? 15? 18? 20? 27? 30?
3. April 2? 6? 10? 15? 17? 20? 27? 29?
4. January 1? 8? 11? 16? 19? 24? 28? 31?
5. October 3? 7? 14? 18? 21? 25? 28? 30?
6. February 5? 8? 11? 12? 16? 19? 23? 25?
7. June 4? 8? 10? 14? 21? 23? 26? 28?

Exercise 78.

1. I bought a lamb for $7 ($8, $6), and another for $8 ($11, $9), and sold them for $20 ($25, $28). Find the gain or loss.

2. Will answered 18 (15, 16) questions, and Alice answered 5 (9, 3) less. How many did the two answer?

3. What is left after taking 3 (5, 7), as often as possible, from 13 (27, 50)?

4. Take 6 (7, 8) from 75 as often as you can, and write down each answer.

5. A man gained $7 ($30, $80) one day, and lost $4 ($20, $30) the next day. Find his total gain or loss.

6. I gained $400 ($900, $300) on wheat, and lost $200, ($500, $800) on hay. Find my total gain, or loss.

7. Selling a house for $700 ($400, $800), I lose $200 ($300, $400). Find the gain if sold for $1,200 ($900, $1,500).

Exercise 79.

How many days from : —

1. Jan. 4 to Feb. 8?
2. Feb. 17 to Mar. 25?
3. Mar. 13 to Apr. 17?
4. April 5 to May 24?
5. May 8 to June 30?
6. June 9 to July 1?
7. July 3 to Aug. 19?

Aug. 10 to Sep. 27?
Sept. 14 to Oct. 12?
Oct. 16 to Nov. 24?
Nov. 18 to Dec. 25?
Mar. 24 to Apr. 17?
July 18 to Aug. 16?
June 17 to July 19?

Exercise 80.

How many days from :—

1. Jan. 1 to March 28? April 15 to June 27?
2. Feb. 4 to April 24? May 14 to July 18?
3. March 9 to May 25? July 28 to Sep. 27?
4. June 24 to Aug. 23? Aug. 2 to Oct. 14?
5. Aug. 17 to Oct. 20? Sep. 27 to Nov. 15?
6. Jan. 18 to March 27? Christmas to New Year?
7. Oct. 15 to Dec. 11? New Year to Christmas?

Exercise 81.

1. What is the age of a person born in 1890? 1887? 1883? 1874? 1865? 1854? 1845? 1830? 1827? 1815?

2. Find the age of a person born in 1888, 1879, 1868, 1847, 1839, 1862, 1819, 1804, 1825, 1849.

3. How old is a coin which bears the date 1804? 1889? 1885? 1866? 1859? 1837? 1812? 1796? 1783? 1760?

4. When was a person born, whose age at present is 4? 7? 11? 13? 15? 18? 22? 25? 28? 36? 45? 48?

5. A person was born in 1824. Find his age in 1830, 1838, 1843, 1847, 1852, 1855, 1859, 1876, 1864, 1897.

6. Find the year of birth of a person who was 7 (9, 15) years old in 1898, in 1893, in 1886, in 1875, in 1847.

7. Five years ago a person was 4 (8, 12, 16, 23, 27) years of age. How old will he be in 4 (6, 8) years?

Exercise 82.

Find the date which is :—

1. 24 days after Jan. 15. 38 days after Dec. 14.
2. 28 days after Aug. 18. 36 days after Oct. 16.
3. 35 days after May 11. 37 days after April 11.
4. 27 days after July 22. 40 days after June 16.
5. 33 days after March 16. 38 days after Sep. 11.
6. 29 days after Nov. 24. 50 days after May 24.
7. 32 days after Feb. 12. 46 days after Aug. 27.

Exercise 83.

1. How much change should a person receive from a dollar bill in paying for goods to the value of 10c.? 30c.? 50c.? 60c.? 80c.? 40c.? 90c.? 70c.? 20c.? 25c.? 35c.? 65c.? 45c.? 75c.? 63c.? 28c.? 42c.? 53c.? 67c.?

2. How much change should I receive from a two-dollar bill when paying 73c.? 84c.? 69c.? 28c.? 35c.? $1.25? $1.35? $1.83? $1.64? $1.29? $1.99? $1.39?

3. How much change is left from ten dollars when paying $2.54? $3.25? $3.79? $4.36? $4.88; $5.29? $6.47? $7.95? $8.42?

Exercise 84.

1. A and B have 17 (25, 48) acres of land. B has 8 (16, 23) acres. How many has A?

2. Two sheep cost $36 ($39, $43). One cost $16 ($22, $27). What did the other cost?

3. A and B have 19 (36, 48) acres of land. A has 3 (6, 12) acres more than B. How much has each?

4. A and B have 24 (48, 65) acres of land. A has 6 (16, 25) less than B. How much has each?

5. A and B have $75 ($435, $100). A has $35 ($125, $34). How much more has B?

6. A and B have $15 ($100, $300). B has $9 ($30, $50). How much less has A?

7. A and B have $12 ($60, $200). B has $5 ($24, $125). Which has the more, and how much?

Exercise 85.

How much change should remain from a five-dollar bill after paying:—

1. 25c. and 36c.?
2. 48c. and 33c.?
3. 47c. and 28c.?
4. 64c. and 37c.?
5. 75c. and 83c.?
6. 84c. and 96c.?
7. 79c. and 88c.?

27c., 36c., and 32c.?
28c., 35c., and 36c.?
54c., 38c., and 62c.?
37c., 45c., and 86c.?
49c., 58c., and 95c.?
65c., 87c., and 93c.?
58c., 36c., and 85c.?

Exercise 86.

1. How many days in each of the following years :—

1860? 1845? 1847? 1832?
1500? 1600? 1800? 1700?
1867? 1842? 1863? 1604?
1876? 1564? 1464? 1264?
1900? 1300? 2000? 1400?

2. How many days in an ordinary year after :— Jan. 17? Feb. 19? March 31? April 30? May 24? Dominion Day? Independence Day? New Year's Day?

3. How many days in a leap year after :— Jan. 13? Jan. 28? Feb. 29? March 15? April 9?

Exercise 87.

1. I bought two horses at $45 each, and sold them to gain $24. How much did I get for the span?

2. I bought two horses at $36 each. How much must I get for them to gain $8 on each?

3. Will was at school the 20 days in May. Rob was absent 3 days, and Charlie 4 days. How many days did the three attend?

4. Will has 16 (28, 37) lambs. Rob has 4 (6, 14) less, and Charlie has as many as both. How many have all?

5. A room is 16 (18, 27) yards long, and 2 (6, 14) yards less in width. How far is it around the room?

6. I gave a dime to pay for 3 cents' worth of pens and 4 cents' worth of paper. How much change do I get?

Exercise 88.

Find the age of a person :—

1. Born Jan. 15, 1876, and died Feb. 15, 1880.
2. Born July 17, 1878, and died Aug. 24, 1882.
3. Born May 24, 1836, and died July 28, 1846.
4. Born Nov. 17, 1867, and died Jan. 28, 1872.
5. Born Dec. 23, 1892, and died Feb. 28, 1897.
6. Born Aug. 14, 1875, and died Nov. 24, 1896.
7. Born May 28, 1883, and died Oct. 20, 1897.

Exercise 89.

Add vertically and horizontally :—

1. 36 + 45 + 83 + 75 + 96 + 45 + 73 = ...
2. 48 + 64 + 79 + 34 + 53 + 35 + 37 = ...
3. 52 + 36 + 58 + 46 + 25 + 76 + 85 = ...
4. 56 + 77 + 34 + 67 + 24 + 84 + 26 = ...
5. 74 + 54 + 86 + 83 + 78 + 29 + 34 = ...
6. 37 + 56 + 97 + 29 + 31 + 51 + 59 = ...
7. 23 + 37 + 57 + 76 + 69 + 67 + 61 = ...

— — — — — — — ——

Exercise 90.

1. A man was born in 1841 (1836, 1857). When will he be 25 (36, 34) years old?

2. A man was born in 1847 (1854, 1865) How old will he be in 1876 (1892, 1883)?

3. Find the sum of all the numbers of two digits that can be made with the figures 2, 3 and 4.

4. Find the sum of the numbers ending in 5 (7, 8) up to 50.

5. Find the sum of the numbers ending in 4 (6, 9) between 50 and 100.

6 Find the sum of the numbers ending in 3, 4, or 8 between 30 and 40.

7. My salary is $900 a year. I spend $48 for clothes, $63 for books, $147 for board and $42 for other things. How much do I save in a year?

Exercise 91.

Add vertically and horizontally :—

1. \$2.34 + \$5.47 + \$8.39 + \$7.64 + \$8.27 = ...
2. \$3.46 + \$7.63 + \$4.76 + \$3.56 + \$4.83 = ...
3. \$5.67 + \$3.48 + \$6.34 + \$2.57 + \$3.54 = ...
4. \$4.43 + \$4.32 + \$8.45 + \$8.33 + \$3.56 = ...
5. \$6.25 + \$6.75 + \$2.65 + \$6.24 + \$8.42 = ...
6. \$5.85 + \$3.45 + \$3.74 + \$4.93 + \$2.36 = ...
7. \$7.24 + \$7.28 + \$4.58 + \$9.68 + \$5.32 = ...

— — — — — ——

Exercise 92.

1. Find the sum of the first five digits.

2. Find the amount of the last five digits.

3. Find the aggregate of all the digits.

4. Find the result of $6+4+5+5+9+7-4-8-2$.

5. Add together 2, 8, 6, 4, 3, 7, 5, 5, 1 and 9.

6. Find the score of a cricket team, if the runs made by the men were 5, 8, 7, 6, 7, 3, 0, 9, 1, 11 and 9.

7. How many times does the clock strike between half-past twelve and five minutes to six?

8. How often does the clock strike from a quarter to one till five minutes past midnight?

9. Write the numbers ending in 6 (4, 8) up to 100.

10. Write down each 4th (7th, 9th) number from 5 to 50.

11. What number is that to which if you add 6 (8, 9) the sum will be 12? 24? 36?

12. I gave 6 (9, 7) apples to Will, 3 more than that to Rob and 5 less than this to Sam. How many does each get? How many do all get?

13. A bag contains 20 (21, 20) apples, oranges and nuts. There are 14 (13, 12) apples and nuts, and 11 (17, 15) oranges and nuts. How many of each are there?

14. A boy has 15 (10, 17) apples and pears, 11 (14, 18) apples and plums, and 12 (12, 19) pears and plums. How many of each has he?

15. A and B were the candidates in an election, and B's majority was 250 (350, 486) out of 4000 votes cast. How many votes did each get?

16. A and B are the candidates in an election. B got 2,300 (2,500, 3,427) out of 4,776 ballots cast. Who was elected, and what was his majority?

17. B was elected by a majority of 87 (264, 325) and A got 2,875 votes. How many ballots were cast?

Exercise 93.

1. Distinguish addition from subtraction.
Show that one is the opposite of the other.
Explain carrying and borrowing.

2. Show that additions, or subtractions, may be made in any order.

3. Work a question in subtraction. Name the parts, and show the relation of each part to each of the others.

4. Show that adding or subtracting the same number from both the minuend and the subtrahend does not alter the difference.

5. Why do we begin to add at the right-hand column?
Could we begin at the left-hand column?

6. How can you prove your answer in addition?
How can you prove your answer in subtraction?

7. What cautions would you observe in writing a question in addition or subtraction?

8. Write down the largest and the smallest number which can be expressed by using all the digits once.

9. Write down, in Arabic Notation, the largest number of 2 (3, 5, 8) digits.

10. Show some advantages of Arabic Notation over Roman Notation.

11. By how much does the sum of two numbers exceed their difference?

12. Given the sum of two numbers and their difference.
How would you find the two numbers?

13. What is the arithmetical complement of:—
2? 4? 5? 3? 7? 9? 8? 1? 6?
24? 36? 45? 25? 56? 87? 63? 92?
245? 356? 428? 562? 874? 985? 849? 287?

14. Find the difference between the largest number and the smallest of three figures which can be expressed by 4, 7 and 9.

15. What two numbers equal 75 and differ by 29?

MULTIPLICATION.

Multiplication is the method of finding the amount of a certain number when it is repeated a given number of times. It is a short method of repeated addition.

The Multiplicand is the number to be multiplied, or repeated.

The Multiplier is the number which tells how often the multiplicand is to be repeated.

It is always an abstract number.

An Abstract Number is one in which the kind of unit is not named, as 4, 3, 8.

A Concrete Number is one in which the kind of unit is named; as 4 men, 3 boys, 8 girls.

The multiplicand and the multiplier are called **the factors.**

The Product is the number obtained by multiplying one number by another.

It is always similar to the multiplicand.

The Square of a number is the product of that number by itself.

If the multiplier consists of two or more figures there will be two or more **partial products.** The sum of these is the product of the two numbers.

× is the sign of multiplication, and, when placed between two numbers, shows that the first is to be multiplied by the second.

$3 \times 2 = 6$, is read, "three multiplied by two, equals six"

Exercise 94.

How many are two times :—

1.	1 apple?	3 pencils?	7 cherries?	8 books?
2.	2 plums?	4 windows?	8 peaches?	7 lambs?
3.	2 cents?	7 chickens?	6 rabbits?	5 geese?
4.	3 hats?	5 robins?	9 questions?	6 boys?
5.	5 birds?	6 boxes?	8 pictures?	9 girls?
6.	4 pens?	4 windows?	7 minutes?	8 ducks?
7.	3 eggs?	3 peaches?	9 inches?	9 hens?

Exercise 95.

1.	1 × 2 =	2 times $2 =	2 times 5 =	$9 × 2 =
2.	2 × 2 =	2 times $3 =	2 times 6 –	$6 × 2 =
3.	3 × 2 =	1 time $2 =	2 times 7 =	$8 × 2 =
4.	4 × 2 =	3 times $2 =	5 times 2 =	$3 × 2 =
5.	2 × 3 =	2 times $4 =	4 times 2 =	$7 × 2 =
6.	2 × 1 =	4 times $2 =	2 times 8 =	$5 × 2 =
7.	4 × 2 =	2 times $5 =	2 times 9 =	$4 × 2 =

Exercise 96.

1. If a pen costs 2 cents, how much must I pay for 2 (3, 5) pens?

2. I can put 2 apples into each of my pockets. How many can I put into 3 (4, 7) of my pockets?

3. I give 2 cents to each of some boys. How much do I give to 4 (6, 7) of the boys?

4. How many shoes will make 2 pair? 3 pair? 5 pair? 7 pair? 8 pair? 9 pair? 10 pair?

5. How many horses are in 3 span? 4 span? 6 span? 8 span? 7 span? 5 span? 9 span? 10 span?

6. A sheep costs $5 ($6, $8). How much will 2 sheep cost? 3 sheep? 4 sheep?

7. I find 3 (6, 9) eggs in each nest. How many eggs will be in 2 nests? 3 nests? 4 nests?

8. How many eyes has a boy? 2 boys? 8 boys? 4 boys? 6 boys? 3 boys? 9 boys? 7 boys? 5 boys?

Exercise 97.

1.	$1 × 3 =	$4 × 3 =	3 × 4 =	$7 × 3 =	$3 × 4 =
2.	$2 × 3 =	$5 × 3 =	3 × 6 =	$6 × 3 =	$3 × 6 =
3.	$3 × 2 =	$6 × 3 =	3 × 5 =	$8 × 3 =	$3 × 5 =
4.	$4 × 3 =	$3 × 5 =	3 × 7 =	$5 × 3 =	$3 × 3 =
5.	$5 × 3 =	$3 × 6 =	3 × 9 =	$9 × 3 =	$3 × [illegible] =
6.	$3 × 4 =	$7 × 3 =	3 × 8 =	$4 × 3 =	$3 × 9 =
7.	$3 × 5 =	$8 × 3 =	3 × 3 =	$8 × 3 =	$3 × 7 =

Exercise 98.

Find the cost of :—

1. 2 pounds rice @ 2 (3, 4) cents a pound.
2. 4 pounds sago @ 3 (2, 4) cents a pound.
3. 3 pounds barley @ 5 (3, 6) cents a pound.
4. 5 pounds sugar @ 2 (3, 4) cents a pound.
5. 2 pounds butter @ 20 (30, 50) cents a pound.
6. 3 pounds cheese @ 30 (20, 40) cents a pound.
7. 2 pounds raisins @ 30 (60, 70) cents a pound.

10 - 3 - 21

Exercise 99.

1. What will it cost to post 2 letters? 4 letters? 7 letters? 9 letters? 5 letters? 6 letters? 8 letters?

2. How many feet have 3 hens? 5 chickens? 4 robins? 8 sparrows? 6 swallows? 9 ducks? 7 geese?

3. How many oxen make 1 yoke? 3 yoke? 2 yoke? 7 yoke? 5 yoke? 9 yoke? 4 yoke? 6 yoke? 8 yoke?

4. How many legs have 2 cows? 2 cats? 2 hens? 2 flies? 2 spiders? 2 bees? 2 cats and 2 dogs?

5. How much land is in 2 fields, each 30 acres? 20 acres? 50 acres? 80 acres? 60 acres? 90 acres? 40 acres?

6. How many ears have 20 dogs? 30 cats? 70 hens? 40 bears? 50 lambs? 30 boys and 60 girls? 100 men?

7. How many wings have 200 robins? 300 larks? 500 bats? 400 eagles? 7000 swallows? 8000 hens? 9000 ducks?

Exercise 100.

What is the cost of :—

1. 2 lbs. sugar @ 3 cents? 3 cows @ $50?
2. 4 lbs. rice @ 3 cents? 4 sheep @ $30?
3. 8 lbs. sago @ 2 cents? 7 lambs @ $20?
4. 5 lbs. barley @ 2 cents? 2 horses @ $90?
5. 3 lbs. starch @ 8 cents? 3 mules @ $60?
6. 2 lbs. cheese @ 9 cents? 8 calves @ $30?
7. 6 lbs. flour @ 3 cents? 9 colts @ $20?

Exercise 101.

Fill the blanks with the proper numbers.

1. .... ×2=6. 2× .... = 6. .... ×3=$15.
2. .... ×2=4. 4× .... =12. .... ×2=$16.
3. .... ×2=8. 8× .... =16. .... ×4=$16.
4. .... ×2=10. 3× .... =15. ... ×3=$21.
5. .... ×2=18. 7× .... =14. .... ×5=$20.
6. .... ×2=16. 6× .... =18. .... ×4=$24.
7. .... ×2=12. 9× .... =27. .... ×2=$18.

Exercise 102.

1. How much must I pay for 3 pencils, if each one costs 3 cents? 5 cents? 8 cents? 7 cents? 9 cents?

2. A boy walks 3 miles a day. How far will he walk in 4 days? 6 days? 7 days? 8 days? a school week?

3. How many pupils are in 3 classes, each containing 5 boys? 8 girls? 6 boys? 7 girls? 4 boys and 5 girls?

4. A man earns $3 a day. How much will he earn in 3 days? 5 days? 20 days? 40 days? 300 days?

5. Will has 4 (7, 9) apples and Alice has 3 times as many. How many have both?

6. A earns $3 ($4, $7) a day, and B earns $4 ($5, $3) a day. How much will the two earn in 3 days?

7. Sam bought 5 (6, 8) plums one day, and three times as many the next. How many plums did he buy?

Exercise 103.

How many are four times :—

1. 2 men? 3 men? 5 men? 4 men? 7 men? 6 men?
2. 4 boys? 5 boys? 3 boys? 8 boys? 6 boys? 7 boys?
3. 3 girls? 4 girls? 2 girls? 7 girls? 5 girls? 8 girls?
4. 5 birds? 8 birds? 3 birds? 9 birds? 4 birds? 6 birds?
5. 2 cents? 3 mice? 5 doves? 8 sheep? 9 pens? 4 books?
6. 40 days? 30 hours? 70 minutes? 90 weeks? 50 years?
7. 300 feet? 200 yards? 500 inches? 400 miles? $700?

MULTIPLICATION TABLE.

Multiply at sight, or as the teacher points.
Every possible combination is included.

1 7	1 9	1 4	1 8	1 6	1 3	1 5	1 2	1 1
2 7	2 9	2 4	2 8	2 6	2 3	2 5	2 2	9 9
3 7	3 9	3 4	3 8	3 6	3 5	3 3	8 8	8 9
4 7	4 9	4 4	4 8	4 6	4 5	7 7	7 8	7 9
5 7	5 9	5 5	5 8	5 6	6 6	6 7	6 8	6 9

Exercise 104.

1. If a sheep costs $4, how much must be paid for 7 sheep? 5 sheep? 9 sheep? 400 sheep? 300 sheep?

2. What is the cost of 400 sheep @ $7? @ $6? @ $9? @ $8? @ $20? @ $30? @ $50? @ $40? @ $400? @ $300?

3. A boy lives 2 miles from school. How far must he walk a day? 2 days? 4 days? a school week? 2 weeks?

4. What must I pay for 2 span of horses if each horse cost $50? $60? $80? $200? $300? $4000 $7000?

5. How many toes has a hen? 2 hens? 5 hens? 8 hens? 7 hens? 4 hens? 9 hens? 3 hens? 6 hens?

6. A walks 4 miles an hour. How far would he walk in 3 hours? 6 hours? 9 hours? 4 hours? 2 hours?

7. A boy lives 1 mile from school and goes home for his dinner. How far does he walk a day? a week? 8 weeks? 9 weeks? 6 weeks? 7 weeks?

Exercise 105.

What quantity is 4 (5, 6) times :—

1. $2? $3? $5? $7? $4? $8? $9? $6? $20? $30? $50?
2. £3? £6? £9? £2? £4? £8? £5? £7? £40? £80?
3. 5c.? 4c.? 8c.? 7c.? 6c.? 3c.? 30c.? 300c.? 3000c.?
4. 4 boys? 2 girls? 6 men? 3 deer? 9 sheep? 7 ducks?
5. 3 months? 4 years? 7 days? 5 hours? 8 weeks?
6. 90 pints? 80 qts.? 60 gallons? 70 bushels? 50 pecks?
7. 30 feet? 40 yds? 70 inches? 60 miles? 90 rods?

Exercise 106.

1. At 5 cents each, what is the cost of 2 apples? 4 apples? 3 pens? 7 books? 8 oranges? 5 lemons?

2. At 5 cents a day, how much will Rob earn in 2 days? 3 days? 6 days? 4 days? 7 days? 5 days? 9 days?

3. Each pupil in the class has 5 books. How many books will 5 boys have? 7 boys? 4 girls and 5 boys?

4. My farm is in 5-acre fields. How much land is in 3 fields? 5 fields? 8 fields? 7 fields? 9 fields? 4 fields?

5. A pound of rice costs 5 cents. Find the cost of 2 lbs., 4 lbs., 8 lbs., 3 lbs., 6 lbs., 9 lbs., 5 lbs., 7 lbs.

6. How much will it cost to register a letter? 2 letters? 5 letters? 8 letters? 9 letters? 7 letters?

7. How many school days in a week? 2 weeks? 5 weeks? 4 weeks? 3 weeks? 6 weeks? 8 weeks?

Exercise 107.

1. 2 × 4 = $7 × 4 =   £2 × 5 = $5 × 3 =   5 × 4 =
2. 4 × 4 = $4 × 7 =   £3 × 5 = $5 × 4 =   4 × 5 =
3. 8 × 4 = $6 × 4 =   £6 × 5 = $5 × 8 =   8 × 4 =
4. 3 × 4 = $4 × 6 =   £9 × 5 = $5 × 7 =   5 × 0 =
5. 6 × 4 = $8 × 4 =   £8 × 5 = $5 × 9 =   6 × 4 =
6. 9 × 4 = $4 × 8 =   £7 × 5 = $5 × 6 =   7 × 5 =
7. 5 × 4 = $0 × 4 =   £4 × 5 = $5 × 5 =   9 × 4 =

Exercise 108.

1. 2×6+4= 6 × .... = 12. .... × 6 = $180.
2. 3×6+5= 6 × .... = 24. .... × 6 = $240.
3. 6×6+2= 6 × .... = 48. .... × 6 = $360.
4. 4×6+3= 6 × .... = 36. .... × 6 = $480.
5. 7×6+3= 6 × .... = 30. .... × 6 = $540.
6. 9×6+5= 6 × .... = 54. .... × 6 = $420.
7. 8×6+4= 6 × .... = 42. .... × 6 = $300.

Exercise 109.

1. A man earns $1 a day. How much will he earn in 1 week? 2 weeks? 4 weeks? 5 weeks? 8 weeks?

2. How much is my weekly wages if my daily wages be $1? $2? $5? $6? 8? $4? $3? $7? $9?

3. A pail holds 6 quarts of berries. How many quarts will fill 3 pails? 5 pails? 8 pails? 6 pails? 9 pails?

4. A roll of butter weighs 6 pounds. How many pounds are in 2 rolls? 4 rolls? 8 rolls? 3 rolls? 9 rolls?

5. How many legs has a fly? 2 flies? 8 flies? 4 flies? 5 flies? 9 flies? 7 flies? 3 flies? 6 flies? 20 flies?

6. How long would it take one man to do a work which 6 men can do in 7 days? 7 days? 9 days? 20 days?

7. I buy toys at 5 cents each, and sell them at 11 cents. What is my gain on 3 toys? 4 toys? 8 toys? 7 toys? 5 toys? 6 toys?

Exercise 110.

Find the cost of:—

1. 3 qts. berries @ 2 (3, 4) c. 2 lbs. rice @ 7 (8, 9) c.
2. 5 lbs. sugar @ 5 (4, 6) c. 4 doz. cakes @ 7 (8, 9) c.
3. 7 qts. milk @ 3 (4, 6) c. 8 pr. laces @ 3 (5, 6) c.
4. 9 lbs. rice @ 3 (5, 4) c. 3 lbs. figs @ 7 (8, 9) c.
5. 8 oz. spice @ 4 (3, 5) c. 6 yds. wire @ 6 (9, 8) c.
6. 6 doz. eggs @ 8 (6, 9) c. 9 pks. oats @ 3 (4, 5) c.
7. 4 lbs. sago at 4 (5, 6) c. 7 doz. plums @ 4 (5, 6) c.

Exercise 111.

1. 3×7= 7×3= ?×7=28. $4×7= £5×7=
2. 5×7= 7×5= ?×7=35. $8×7= £6×7=
3. 4×7= 7×4= ?×7=21. $6×7= £3×7=
4. 8×7= 7×8= ?×7=63. $5×7= £9×7=
5. 6×7= 7×6= ?×7=49. $7×7= £8×7=
6. 7×7= 7×7= ?×7=42. $9×7= £4×7=

Exercise 112.

1. If 7 yards of cloth make a lady's dress, how many yards are used to make 2 dresses? 4 dresses? 3 dresses?

2. How many days in 1 week? 2 weeks? 3 weeks? 5 weeks? 8 weeks? 4 weeks? 6 weeks? 9 weeks?

3. If 7 persons sit in a pew, how many sit in 2 pews? 3 pews? 5 pews? 7 pews? 9 pews? 8 pews? 6 pews?

4. At $7 a month, what is the rent for 2 months? 3 months? 4 months? 5 months? 6 months? 7 months?

5. How long will it take a man to do a work which 7 men do in 2 days? 3 days? 5 days? 9 days? 7 days?

6. At 7 cents each, what would 30 oranges cost? 20 oranges? 40 oranges? 80 oranges? 60 oranges?

7. If the pods average 7 peas in each, how many peas will be in 30 pods? 70 pods? 90 pods? 60 pods?

8. Tom has $9 ($6, $20), and Rob has 6 times as much. How much money have the two?

Exercise 113.

What is 8 times (9 times, 10 times) :—

1. 1? 2? 3? 4? 5? 6? 7? 8? 9? 10?
2. $4? $8? $3? $6? $9? £5? £7? £2? £8? £10?
3. 2 men? 4 boys? 6 girls? 8 women? 7 lads? 5 lasses?
4. 3 yards? 6 feet? 9 inches? 8 rods? 4 miles?
5. 80 days? 70 hours? 40 weeks? 60 months? 50 years?
6. 20 pints? 30 qts.? 90 gallons? 60 pecks? 40 bushels?

Exercise 114.

1. James learns 8 verses a week. How many will he learn in 2 weeks? 3 weeks? 6 weeks? 4 weeks?

2. Rob sleeps 8 hours a day. How much will he sleep in 2 days? 8 days? 4 days? 9 days? 7 days?

3. Will earns $8 a month. What is his wages for 3 months? 2 months? 5 months? 8 months? 4 months?

4. I buy lambs at $8 each. How much must I pay for 2 lambs? 3 lambs? 5 lambs? 6 lambs? 8 lambs?

5. How many shoes are required for a span of horses? 3 span? 5 span? 8 span? 4 span? 9 span? 6 span?

6. How many pints in a gallon? 3 gallons? 4 gallons? 5 gallons? 8 gallons? 7 gallons? 9 gallons?

7. How many legs has 1 spider? 2 spiders? 4 spiders? 8 spiders? 6 spiders? 7 spiders? 9 spiders? 5 spiders?

8. How many fingers has a boy? 2 boys? 3 girls? 5 girls? 7 boys? 5 girls and 4 boys? 11 girls and 9 boys?

Exercise 115.

1. At 9 cents a dozen how much must I pay for 2 dozen plums? 3 doz.? 5 doz.? 4 doz.? 8 doz.? 7 doz.?

2. An orchard has 9 trees in a row. How many trees are in 3 rows? 2 rows? 5 rows? 6 rows? 7 rows?

3. A horse goes 9 miles an hour. How far will it go in 2 hours? 3 hours? 6 hours? 9 hours? 4 hours?

4. James gets 9 questions a day. How many questions will he get in 3 days? 2 days? 7 days? 4 days?

5. A man works 9 hours a day. How many hours will he work in 4 days? 7 days? 8 days? 9 days?

6. How far will a train go in 9 hours going 20 miles an hour? 30 miles? 60 miles? 40 miles? 80 miles? 50 miles? 70 miles? 90 miles?

7. I earn $30 a month and spend $21. How much do I save in 2 months? 3 months? 5 months? 6 months? 7 months? 4 months? 9 months? 8 months?

Exercise 116.

Find the product of :—

1. 2 and 5. 9 and 2. 8 and 2. 8 and 9. 2 and 4.
2. 4 and 6. 8 and 4. 7 and 8. 6 and 8. 6 and 2.
3. 5 and 8. 2 and 7. 5 and 6. 5 and 7. 3 and 5.
4. 3 and 7. 7 and 6. 4 and 5. 9 and 5. 9 and 3.
5. 6 and 9. 4 and 9. 9 and 7. 3 and 8. 4 and 7.

Exercise 117.

1. A man bought 8 (15, 23) horses @ $37 and sold them @ $45. Find his total gain.

2. A man bought 35 horses @ $63 ($65, $75), and sold them @ $75 ($80, $87). Find his gain on all.

3. A man bought 8 horses @ $55, and 7 horses @ $63, and sold them all @ $70. Find his total gain.

4. A man bought 36 horses @ $43, and 45 horses @ $61. Find his gain or loss by selling them all @ $55.

5. A approaches B at the rate of 3 miles an hour, and B approaches A at the rate of 4 miles an hour. How much nearer will they be in 5 (8, 10) hours?

6. A and B approach each other at the rate of 4 and 5 miles an hour respectively: They meet in 7 (9, 11) hours. How far apart were they?

7. A and B start from the same place, and travel in opposite directions at 5 and 8 miles an hour respectively. How far apart will they be in 3 (5, 8) hours?

Exercise 118.

Find the factors of :—

1. 12. 20. 27. 35. 45. 56. 72. 90.
2. 14. 21. 28. 36. 48. 60. 75. 96.
3. 15. 22. 30. 40. 50. 63. 81. 99.
4. 16. 24. 32. 42. 54. 64. 84. 100.
5. 18. 25. 33. 44. 55. 70. 88. 108.

Exercise 119.

Find the continued product of :—

1.	2, 5 and 8.	4, 8 and 2.	5, 7 and 6.
2.	5, 6 and 4.	7, 8 and 5.	8, 9 and 4.
3.	4, 9 and 5.	9, 5 and 6.	9, 7 and 8.
4.	7, 5 and 6.	8, 7 and 3.	4, 4 and 6.
5.	3, 5 and 7.	5, 9 and 4.	5, 5 and 8.

Exercise 120.

1.	24 × 3 × 5 =	32 × 5 × 6 =	25 × 7 × 4 =
2.	16 × 4 × 5 =	48 × 3 × 5 =	45 × 5 × 6 =
3.	25 × 8 × 3 =	44 × 6 × 5 =	35 × 7 × 4 =
4.	36 × 3 × 8 =	42 × 8 × 5 =	55 × 3 × 8 =
5.	27 × 4 × 5 =	36 × 4 × 5 =	35 × 5 × 6 =

Exercise 121.

Multiply, using the factors of the multipliers :—

1.	15 × 12.	28 × 35.	35 × 32.	32 × 24.
2.	25 × 16.	36 × 15.	45 × 24.	24 × 36.
3.	32 × 25.	44 × 25.	25 × 48.	28 × 32.
4.	24 × 15.	32 × 45.	75 × 36.	32 × 36.
5.	35 × 24.	48 × 55.	55 × 16.	42 × 48.

Exercise 122.

1. How many faces has a cube? 3 cubes? 5 cubes? 8 cubes? 9 cubes? 7 cubes? 4 cubes? 6 cubes?

2. How many sides has a square? 5 squares? 9 squares? 7 squares? 8 squares? 4 squares? 6 squares? 3 squares?

3. How many marbles in a score? 2 score? 4 score? 8 score? 9 score? 7 score? 3 score? 6 score? 5 score?

4. How many are six tens? 8 tens? 4 tens? 7 tens? 9 tens? 5 rens? 12 tens? 15 tens? 20 tens? 25 tens?

5. How many eggs are in a dozen? 2 doz.? 3 doz.? 5 doz.? 7 doz.? 9 doz.? 8 doz.? 4 doz.? 6 doz.?

6. What number divided by 4 (5, 8) will give a quotient of 7? 8? 6? 4? $5? $9? $16? 15 sheep? 24 boys?

Exercise 123.

1. $6+7+3+5+5+9+1+8+2+6+4+1+9+4=$
2. $5+9+1+5+5+8+2+7+3+6+4+5+5+6=$
3. $7+6+4+8+2+3+7+5+5+4+8+2+9+1=$
4. $8+5+6+4-7-3+8+2+9+1-5-5+6+4=$
5. $3+6+4+2+7+3+4+5+5+7+4+6+8+2=$
6. $16+13+17+16+14+18+12+19+21+35+25=$
7. $19+28+22+13+27+25+15+36+34+19+31=$

Exercise 124.

1. Find the cost of 3 sheep @ $8, 4 calves @ $8, 2 lambs @ $8, and 3 hogs @ $8.

2. Find the total cost of 8 toys @ 9 cents, 7 books @ 9 cents, and 5 pens @ 9 cents.

3. Find the aggregate cost of 9 books @ 5 cents, 8 books @ 9 cents, and 9 books @ 7 cents.

4. Find the cost of 8 cows @ $25, 25 sheep @ $9, and 25 lambs @ $3.

5. Find the cost of 26 horses @ $75, and 75 cows @ $24.

6. Find the cost of 34 horses @ $46, and 23 cows @ $32.

7. Find the sum of 23 times $45, 45 times $28, 32 times $45, and 45 times $17.

8. A gave 75 cows worth $37 each to pay for 47 horses worth $75 each. How much cash must he pay?

Exercise 125.

1. Multiply 25 by 32, 44, 36, 26, 34, 56, 66, 84.
2. Multiply 45 by 16, 24, 32, 36, 44, 50, 64, 96.
3. Multiply 36 by 15, 25, 45, 35, 55, 75, 125, 105.
4. Multiply 72 by 24, 25, 28, 36, 60, 48, 78, 68.
5. Multiply 64 by 5, 25, 75, 125, 250, 750, 1250.
6. Multiply 125 by 24, 36, 48, 72, 32, 64, 96, 108.

Exercise 126.

$6=3+3=4+2=5+1$
$=4+1+1=3+2+1=3+1+2=2+2+2=1+2+3$, etc.
$=3\times2=2\times3=2\times2+2=1\times3+3=1\times4+2$, etc.

Make statements similar to these about :—

2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

4 men, 8 boys, 9 men, 12 sheep, 15 lambs, 16 hens.

Exercise 127.

1. How much are 9 3's? 5's? 9's? 7's? 4's? 6's? 8's?

2. How many wheels are on 5 wagons? 7 wagons? 9 wagons? 6 wagons? 11 wagons? 15 wagons?

3. A hen lays an egg a day. How many will she lay in a week? 3 weeks? 5 weeks? 7 weeks? 6 weeks?

4. How many sides have 3 triangles? 5 triangles? 7 triangles? 9 triangles? 8 triangles? 6 triangles?

5. At $8 a month, find my wages for 3 months? 7 months? 9 months? 1 year? 1 year and 6 months?

6. B steps two feet. How far will he go in 3 steps? 8 steps? 9 steps? 11 steps? 45 steps? 86 steps?

7. How long will it take one pipe to fill a vat that 5 pipes fill in 4 hours? 8 hours? 7 hours? 9 hours?

8. How many pipes will fill a vat in one hour if 6 pipes fill it in 5 hours? 7 hours? 3 hours? 8 hours? 9 hours?

Exercise 128.

1. Find the square of 3, 8, 6, 7, 9, 4, 2, 1.

2. How much is 2^2? 3^2? 4^2? 5^2? 6^2? 7^2? 8^2? 9^2?
10^2? 20^2? 40^2? 30^2? 60^2? 80^2? 70^2? 50^2? 90^2?
11^2? 15^2? 25^2? 35^2? 45^2? 65^2? 85^2? 75^2? 95^2?

3. 1^3, 2^3, 3^3, 4^3, 5^3, 6^3, 7^3, 8^3, 9^3, 20^3.

4. Give the third power of 10; the fourth power of 6.

5. Find 6^3, 5^4, 4^5, 3^6, 2^5, 8^4, 9^3, 7^4, 5^6, 2^7.

Exercise 129.

1. Find the continued product of 2, 3, 5, 4 and 7.

2. From the product of 25 and 36 take 27 times 25.

3. What is the sum, the difference and the product of 13 and 8? 15 and 12? 24 and 35? 45 and 36?

4. Rob is 16 years old and Mary is 12. Find the difference in their ages in 8 years, 12 years, 27 years.

5. Alice has 5 (8, 9) cents more than Mary, and together they have 35 (40, 63) cents. How much has each?

Exercise 130.

1. What is the remainder when eight is subtracted as often as possible from 45? 63? 75? 84? 93? 88? 47? 65?

2. I owed $82, and paid $36 ($27, $34) at one time, and $29 ($16, $29) at another. How much do I owe yet?

3. How much will I have left out of $99 after paying $18 two times? 3 times? 4 times? 5 times?

4. The sum of three numbers is 70 (83, 100). The first and second are 36 and 29. Find the third.

5. The sum of three numbers is 65 (82, 100). If 38 is the sum of two of them, find the third.

6. By how much does the sum of 83 (75, 97) and 96 (54, 82) exceed their difference?

7. I have 23 (28, 35) apples and plums. How many of each have I if there are 3 (4, 7) more apples than plums?

Exercise 131.

Give two answers to these questions :—

1. $7+7+7+7+7+7+7=$ $(3+2)+(3+2)+(3+2)=$
2. $5+5+5-5-5+5+5=$ $(4+5)-(4+5)+(4+5)=$
3. $6+6+6+12+12+12+6=$ $(8-5)+(8-5)+(8+5)=$
4. $8+16+16+8+24+24+8=$ $(6\times 7)+(6\times 7)+(6\times 7)=$
5. $7+14+21+14+7+28=$ $(9\div 3)+(9\div 3)+(9\div 3)=$
6. $9+18+18-27+36-27=$ $(8\div 4)-(8\div 4)+(8\div 4)=$

Exercise 132.

$23 \times 27 = (3 \times 7 + 20 \times 30) = 621.$

1.	$13 \times 17 =$	$25 \times 25 =$	$53 \times 57 =$	$64 \times 66 =$
2.	$12 \times 18 =$	$28 \times 22 =$	$52 \times 58 =$	$73 \times 77 =$
3.	$15 \times 15 =$	$26 \times 24 =$	$65 \times 65 =$	$69 \times 61 =$
4.	$14 \times 16 =$	$35 \times 35 =$	$74 \times 76 =$	$71 \times 79 =$
5.	$11 \times 19 =$	$39 \times 31 =$	$81 \times 89 =$	$85 \times 85 =$
6.	$23 \times 27 =$	$47 \times 43 =$	$95 \times 95 =$	$92 \times 98 =$

Exercise 133.

1.	$105 \times 105 =$	$153 \times 157 =$	$296 \times 294 =$	$693 \times 697 =$
2.	$109 \times 101 =$	$198 \times 192 =$	$291 \times 299 =$	$594 \times 596 =$
3.	$106 \times 104 =$	$199 \times 191 =$	$393 \times 397 =$	$701 \times 709 =$
4.	$113 \times 117 =$	$196 \times 194 =$	$404 \times 406 =$	$892 \times 898 =$
5.	$118 \times 112 =$	$297 \times 293 =$	$253 \times 257 =$	$754 \times 756 =$
6.	$124 \times 126 =$	$395 \times 305 =$	$252 \times 258 =$	$999 \times 991 =$

Exercise 134.

1.	$170 \times 13 =$	$530 \times 570 =$	$9930 \times 997 =$
2.	$160 \times 14 =$	$650 \times 650 =$	$9920 \times 998 =$
3.	$250 \times 25 =$	$380 \times 320 =$	$9950 \times 995 =$
4.	$290 \times 21 =$	$740 \times 760 =$	$9960 \times 994 =$
5.	$280 \times 22 =$	$990 \times 910 =$	$7960 \times 794 =$
6.	$370 \times 33 =$	$860 \times 840 =$	$5920 \times 598 =$
7.	$460 \times 44 =$	$520 \times 580 =$	$4930 \times 497 =$

Exercise 135.

1. Find the cost of 26 (37, 52) cows @ $24 ($33, $58).
2. Find the cost of 470 (510, 660) horses @ $43 ($59, $64).
3. Find the value of 54 (55) sheep @ $5.60 ($5.50).
4. Find the value of 193 (295) lots @ $197 ($295).
5. What must I pay for 35 (43) cows at $45 ($37, $52)?
6. Find the cost of 570 (640, 970) horses @ $63 ($76, $83).
7. How many sheep in 82 (87) cars, each 780 (930) sheep?

Exercise 136.

$19\times21=\{(20-1)(20+1)\}=(20^2-1^2)=400-1=399.$

1. $19\times21=$ $29\times31=$ $39\times41=$ $790\times81=$
2. $18\times22=$ $28\times32=$ $36\times44=$ $770\times83=$
3. $17\times23=$ $27\times33=$ $31\times49=$ $780\times82=$
4. $16\times24=$ $26\times34=$ $45\times35=$ $650\times75=$
5. $15\times25=$ $24\times36=$ $47\times53=$ $630\times77=$
6. $14\times26=$ $23\times37=$ $56\times64=$ $820\times98=$

Exercise 137.

1. $16\times24=$ $55\times65=$ $48\times52=$ $560\times64=$
2. $25\times35=$ $54\times46=$ $63\times57=$ $470\times53=$
3. $27\times33=$ $73\times87=$ $82\times98=$ $850\times95=$
4. $36\times44=$ $64\times76=$ $75\times85=$ $340\times46=$
5. $39\times41=$ $83\times97=$ $34\times46=$ $280\times320=$
6. $27\times13=$ $64\times56=$ $47\times53=$ $760\times840=$

Exercise 138.

Find the value of:—

1. 11 sheep @ \$9. 550 books @ 65c. 760 lambs @ \$8.40.
2. 21 cows @ \$19. 450 cows @ \$45. 530 sheep @ \$4.70.
3. 18 books @ 22c. 730 boxes @ 67c. 530 books @ \$6.70.
4. 34 boxes @ 26c. 890 horses @ \$91. 860 hogs @ \$9.40.
5. 37 cows @ \$43. 620 hats @ 58c. 7200 hats @ \$6.80.
6. 54 horses @ \$66. 560 lambs @ \$64. 7800 coats @ \$8.20.

Exercise 139.

What change is received from \$5 when paying for:—

1. 27 books @ 23c.? 22 books @ 18c.?
2. 29 hats @ 21c.? 25 brooms @ 15c.?
3. 25 caps @ 25c.? 23 caps @ 17c.?
4. 28 maps @ 22c.? 24 pens @ 16c.?
5. 26 pins @ 24 c.? 19 papers @ 21c.?
6. 22 vases @ 28c.? 33 pails @ 27c.?

Exercise 140.

1. 4 × 25 = 5 × 25 = 6 × 25 = 7 × 25 =
2. 8 × 25 = 9 × 25 = 10 × 25 = 11 × 25 =
3. 12 × 25 = 17 × 25 = 22 × 25 = 19 × 25 =
4. 16 × 25 = 21 × 25 = 30 × 25 = 27 × 25 =
5. 24 × 25 = 37 × 25 = 34 × 25 = 35 × 25 =
6. 36 × 25 = 45 × 25 = 42 × 25 = 43 × 25 =
7. 48 × 25 = 49 × 25 = 46 × 25 = 51 × 25 =

Exercise 141.

1. 47 × 11 = 73 × 21. 87 × 31. 85 × 41. 37 × 601.
2. 65 × 11 = 65 × 21. 65 × 31. 64 × 51. 54 × 801.
3. 96 × 11 = 48 × 21. 43 × 31. 93 × 61. 69 × 501.
4. 75 × 11 = 92 × 21. 92 × 31. 75 × 71. 48 × 401.
5. 82 × 11 = 57 × 21. 38 × 31. 48 × 81. 73 × 301.
6. 59 × 11 = 64 × 21. 47 × 31. 67 × 91. 95 × 901.
7. 38 × 11 = 86 × 21. 96 × 31. 36 × 121. 86 × 701.

Exercise 142.

1. 392 − 8 × 25 = 75 × 6 − 225 = 28 × 4 − 7 × 4 =
2. 654 − 7 × 43 = 83 × 4 − 230 = 35 × 8 − 8 × 21 =
3. 429 − 6 × 35 = 69 × 3 − 107 = 47 × 16 − 16 × 25 =
4. 567 − 5 × 42 = 36 × 4 − 84 = 34 × 18 − 16 × 34 =
5. 398 − 7 × 31 = 73 × 9 − 137 = 27 × 15 − 15 × 23 =
6. 349 − 4 × 62 = 87 × 5 − 225 = 28 × 46 − 28 × 21 =
7. 367 − 3 × 82 = 95 × 8 − 360 = 73 × 68 − 53 × 68 =

Exercise 143.

1. 26 × 24 − 22 × 28 = 21 × 25 − 20 × 26 =
2. 27 × 33 − 31 × 39 = 54 × 56 − 53 × 57 =
3. 36 × 44 − 35 × 45 = 67 × 73 − 63 × 77 =
4. 28 × 32 − 26 × 34 = 76 × 74 − 72 × 78 =
5. 25 × 28 − 24 × 25 = 83 × 87 − 80 × 90 =
6. 36 × 25 − 28 × 25 = 56 × 64 − 52 × 68 =
7. 37 × 25 − 25 × 33 = 56 × 54 − 25 × 48 =

Exercise 144.

1. I bought 28 (45, 36) cows @ $25 ($40, $31) and sold them @ $36 ($35, $46). Find the total loss or gain.

2. I bought eggs @ 11 (15, 16) cents a dozen, and sold them @ 15 (13, 19) cents a dozen. Find my loss or gain on 100 dozen.

3. I bought 72 horses @ $96, and sold them @ $121 ($80, $112). Find the total gain or loss.

4. I bought 56 cows @ $47 ($35, $48), and sold them to gain $23 ($25, $22) on each. What did I get for all?

5. I sold 64 cows @ $47 ($63, $55) gaining $17 ($18, $13) on each. How much did they all cost me?

6. I bought 34 acres @ $55 and 24 acres @ $28. Find gain or loss by selling @ $40 an acre.

7. I bought 45 cows @ $27, and sold 21 of them @ $33 and the others @ $25. Find total gain or loss.

Exercise 145.

1. A man can row 5 (7, 9) miles an hour, in still water. How far can he row in 3 (4, 5) hours down a stream running 2 (3, 5) miles an hour?

2. A man can row 8 (9, 12) miles an hour, in still water. How far can he go in 3 (8, 4) hours up a stream running at the rate of 2 (4, 5) miles an hour?

3. A man can row 6 (8, 9) miles an hour, in still water, and 8 (12, 12) miles an hour down stream. How far does the stream run in 4 (5, 9) hours?

4. A man can row 9 (10, 12) miles an hour in still water, and 8 (7, 10) miles an hour, up stream. How far will a leaf float down stream in 2 (6, 9) hours?

5. I row up stream at the rate of 24 (35, 48) miles in 3 (5, 8) hours, and 20 (21, 36) miles in 5 (7, 9) hours, down stream. Find the rate of the stream.

6. A man rows 12 (16, 20) miles an hour, down stream, and 8 (10, 14) miles an hour, up stream. How far will the man row in the still water in 6 (4, 7) hours?

Exercise 146.

1. How many plums will I have left out of 45 after giving 6 plums to each of 4 boys? 6 boys? 5 boys?

2. What number taken from 100 leaves 35? 46? 28? 87? 54? 71? 62? 19? 49? 69? 9? 38? 99?

3. Beginning at 10 rows a day and hoeing one row less each succeeding day, I hoed my turnips. How many rows were there?

4. A train travelling 15 (25, 18) yards a second, passes a point in 5 (7, 9) seconds. Find the length of the train.

5. B made 33 bank deposits, each $37, and drew out $33 on 17 occasions. How much had he then in the bank?

6. My salary is $1000 a year. I pay $4 a week for board, $10 a month for my room, and $1 a day for other things. How much do I save in a year?

7. Two trains start together in the same direction at rates of 25 miles and 32 miles an hour respectively. How far apart will they be in 4 (7, 9) hours?

Exercise 147.

1. Find the difference between 64×66 and 63×67.

2. Find the difference between the cost of 34 cows @ $36 and 350 lambs @ $3.50.

3. If 45 times 37 = 1665, find 39 times 45.

4. My salary is $800 a year; my expenses $8 a week. Find my yearly savings.

5. A gets 16 cents an hour, and B 14 cents. How much will the two earn in 14 hours? 16 hours? 28 hours?

6. Find the difference between the cost of 4 (5, 6) doz. oranges @ 3 for 5 cents, and @ 4 for 5 cents.

7. Two trains travel in the same direction at the rate of 24 and 36 miles an hour respectively. How far apart will they be in 9 hours? 8 hours? 7 hours? 12 hours?

8. Two trains travel in opposite directions at the rate of 18 and 32 miles an hour respectively. How far apart will they be in 9 hours? 12 hours? 16 hours? 25 hours?

Exercise 148.

1. How is the product of two numbers obtained?

2. Explain 6 × 4 = 24. Which is the multiplier? Name all the parts and show their relation to each other.

3. Why must the multiplier always be an abstract number?

4. Show that 3 times 4 = 4 times 3.

5. Show that if any two of the three parts of a question in multiplication are given the other may be found.

6. What addition questions can be worked by multiplication?

7. What is the last figure of the product if one of the factors is 5? 10? 2?

8. What are the partial products in a question in multiplication?

9. To have only two partial products, how would you multiply by 246? 255? 364? 427? 14,412?

10. To have only three partial products, how would you multiply by 36,546? 63,729? 817,299? 172,814,412?

11. Show how to prove your answer to a question in multiplication by casting out the 9's. Show the errors to which it is liable.

Give two other methods of proving your answer.

12. What is the short method of multiplying by :—
10? 100? 1000? 25? 250? 75? 175? 375?
99? 999? 49? 69? 98? 97? 198? 290?
11? 111? 101? 1001? 45? 63? 72? 120? 360?

13. Find two numbers whose product is 6 (15, 21) and whose sum is 7 (8, 10).

14. Find the product of the sum and difference of 24 and 36; 23 and 47; 64 and 32.

15. How many numbers of two figures can be written with the nine digits? the ten figures?

16. What numbers are factors of 18? 24? 36? 48?

DIVISION.

Division is the process of finding how often one number is contained in another. It is a short method of repeated subtraction.

The Dividend is the number to be divided.

The Divisor is the number by which we divide.

The Quotient is the number which shows how often the divisor is contained in the dividend.

The Remainder is the number which is left after the divisor has been taken as often as possible from the dividend.

It is always similar to the dividend.

÷ is the sign of division, and when placed between two numbers shows that the first number is to be divided by the second.

6÷2=3, is read, "six divided by two, equals three."

A Measure of a number is a number which will divide it exactly, *i.e.*, without a remainder.

A Multiple of a number is a number which will contain it exactly.

Cancellation is a process of shortening division by removing equal measures or factors from both divisor and dividend.

The square root of a quantity is the number which, multiplied by itself, will produce the given quantity

√ is called the **Radical Sign** and when placed before a number shows that the square root of that number is to be found.

Similar Numbers are those of the same denomination.

Exercise 149.

Find the half of :—

1. 2 boys.	10 cents.	16 books.	2 tens.	$40.
2. 4 men.	12 pens.	18 hens.	4 tens.	$60.
3. 6 girls.	16 plums.	10 birds.	8 tens.	$20.
4. 8 plums.	14 cherries.	12 ducks.	6 tens.	$80.
5. 6 apples.	18 apples.	20 chicks.	1 ten.	$10.
6. 4 pears.	20 eggs.	14 geese.	3 tens.	$30.
7. 8 cents.	22 lambs.	24 eggs.	5 tens.	$50.

16-3-21

Exercise 150.

Divide into two equal shares :—

1. 4 apples, 8 apples, 16 apples, 20 apples, 30 apples.
2. 6 acres, 4 acres, 8 acres, 14 acres, 40 acres, 50 acres.
3. $20, $40, $80, $60, $10, $30, $70, $90, $50.
4. 1 acre, 3 acres, 5 acres, 7 acres, 9 acres, 11 acres.
5. 21 days, 23 hours, 25 weeks, 45 months, 67 years, $89.
6. 11 plums, 13 pears, 17 apples, 15 eggs, 19 peaches.
7. $31, $33, $35, $37, $51, $55, $53, $77, $99, $75, $57.

Exercise 151.

1. How often can you subtract 2 from 2? 4? 8? 10? 14? 6? 12? 18? 16? 20? 22? 24? 40? 80? 5? 9? 11? 17?

2. Find the cost of one acre, if 2 acres cost $2, $4, $8, $6, $10, $14, $18, $12, $16, $20, $40, $60.

3. How many span are 4 horses? 6 horses? 8 horses? 10 horses? 16 horses? 20 horses? 18 horses? 14 horses?

4. How many twos are in 4? 8? 6? 10? 2? 14? 18? 16? 12? 20? 22? 24? 40? 60? 80? 42? 62? 84?

5. Will earns 2 cents a day. In how long will he earn 4 cents? 8 cents? 6 cents? 12 cents? 14 cents? 18 cents?

6. Find ½ of $6, $10, 8 sheep, 12 lambs, 20 cows, 21 mice, 25 trees, 27 logs, 29 pounds, 31 acres, 33 yards.

7. Find ½ of 6, 8, 12, 16, 18, 20, 24, 30, 36, 40, 48; of 1, 3, 5, 7, 9, 11, 13, 17, 21, 27, 41, 43, 35, 37, 59.

Exercise 152.

1.	2÷2=	$4÷2=	20÷2=	46÷2	$10÷2
2.	4÷2=	$6÷2=	60÷2=	64÷2	$12÷2
3.	8÷2=	$2÷2=	40÷2=	28÷2	$14÷2
4.	6÷2=	£8÷2=	80÷2=	82÷2	$18÷2
5.	0÷2=	£4÷2=	24÷2=	48÷2	$16÷2
6.	10÷2=	£6÷2=	42÷2=	84÷2	$20÷2
7.	12÷2=	$8÷2=	86÷2=	88÷2	$22÷2

Exercise 153.

1. 1÷2= $1÷2= 21÷2= 10÷2= 31÷2=
2. 3÷2= $5÷2= 23÷2= 30÷2= 33÷2=
3. 5÷2= $3÷2= 29÷2= 50÷2= 35÷2=
4. 7÷2= $7÷2= 27÷2= 70÷2= 55÷2=
5. 9÷2= $9÷2= 43÷2= 90÷2= 77÷2=
6. 11÷2= $13÷2= 45÷2= 110÷2= 99÷2=
7. 13÷2= $15÷2= 67÷2= 113÷2= 57÷2=

Exercise 154.

1. What number added to itself will make 8? 6? 12? 4? 10? 8 horses? 4 cows? 6 sheep? 10 lambs? 12 deer.

2. How many will each get, when Will shares 4 apples with Alice? 8 apples? 12 apples? 6 apples? 16 apples?

3. How many letters can I post for 4 cents? 6 cents? 8 cents? 10 cents? 14 cents? 13 cents? 9 cents?

4. How many apples in 4 halves? 8 halves? 6 halves? 10 halves? 14 halves? 7 halves? 9 halves? 5 halves?

5. How many 2's in 3? 5? 11? 9? 15? 13? 21? 27? 29? 41? 63? 85? 31? 33? 35? 37? 39? 53? 51? 59?

6. How many pairs in 6 shoes? 8 shoes? 10 shoes? 4 shoes? 12 shoes? 20 shoes? 18 shoes? 14 shoes?

7. At 2 plums for a cent, how much must I pay for 4 plums? 8 plums? 16 plums? 14 plums? 12 plums?

Exercise 155.

What is one-third of:—

1. $3? $6? $9? $12? $15? £18? £24? £27? £21?
2. 6 sheep? 12 lambs? 15 hens? 18 ducks? 24 bells?
3. 9 stars? 3 suns? 6 moons? 21 lakes? 33 ponds?
4. 7 cents? 10 cents? 16 cents? 19 cents? 25 cents?
5. 5 pears? 8 pears? 11 pears? 17 doz.? 23 doz.?
6. £30? £60? £90? 150c.? 180c.? $2.10? $2.40?
7. $300? $330? $360? $4.50? $4.80? $6.30? $6.60?

Exercise 156.

1. $3 \div 3 =$ $30 \div 3 =$ $7 \div 3 =$ $8 \div 3 =$ $45 \div 3 =$
2. $6 \div 3 =$ $60 \div 3 =$ $10 \div 3 =$ $11 \div 3 =$ $48 \div 3 =$
3. $9 \div 3 =$ $90 \div 3 =$ $16 \div 3 =$ $14 \div 3 =$ $42 \div 3 =$
4. $12 \div 3 =$ $33 \div 3 =$ $13 \div 3 =$ $23 \div 3 =$ $75 \div 3 =$
5. $15 \div 3 =$ $36 \div 3 =$ $22 \div 3 =$ $26 \div 3 =$ $56 \div 3 =$
6. $18 \div 3 =$ $69 \div 3 =$ $25 \div 3 =$ $29 \div 3 =$ $72 \div 3 =$
7. $21 \div 3 =$ $96 \div 3 =$ $31 \div 3 =$ $17 \div 3 =$ $78 \div 3 =$

Exercise 157.

1. How many 3's are in 6? 9? 12? 15? 24? $21? $27? $30? $15? $18? 12 cents? 15 cents? 27 cents?

2. At $3 a day how long will I be earning $9? $6? $12? $21? $24? $15? $18? $30? $27? $33?

3. What is $\frac{1}{3}$ of 9 sheep? 15 cows? 12 boys? 6 pens? 12 books? $18? $24? £15? £18? 12 cents? 1 dozen?

4. Three pencils cost a cent. How much will 6 pencils cost? 9 pencils? 15 pencils? 12 pencils? 18 pencils?

5. How many yards are in 3 feet? 6 feet? 12 feet? 9 feet? 15 feet? 14 feet? 17 feet? 20 feet? 22 feet?

6. How many have I left after selling $\frac{1}{3}$ of 6 houses? 9 plums? 12 apples? 15 horses? 12 sheep? 18 dozen?

7. How much have I left after selling $\frac{1}{3}$ of $6? $9? £9? £12? 9 acres? 6 quarts? 12 bushels? 15 pounds?

Exercise 158

(1) Find $\frac{1}{4}$ of :— (2) Find $\frac{3}{4}$ of :—

1. 4 lambs. 16 boys. 40 quarts. 52 days.
2. 8 sheep. 20 girls. 80 pints. 56 hours.
3. 12 birds. 12 men. 44 gallons. 64 weeks.
4. 16 geese. 24 cents. 48 pecks. 68 months.
5. 20 hens. 28 acres. 84 bushels. 72 years.
6. 24 cents. 32 yards. 88 miles. 76 pounds.
7. 28 men. 36 feet. 128 rods. 16 tons.

Exercise 159.

1.	12÷4=	44÷4=	64÷4=	240÷4=	664÷4=
2.	16÷4=	88÷4=	68÷4=	360÷4=	628÷4=
3.	24÷4=	84÷4=	92÷4=	284÷4=	736÷4=
4.	20÷4=	48÷4=	72÷4=	488÷4=	752÷4=
5.	28÷4=	52÷4=	76÷4=	596÷4=	956÷4=
6.	36÷4=	56÷4=	96÷4=	972÷4=	948÷4=
7.	32÷4=	58÷4=	100÷4=	936÷4=	742÷4=

Exercise 160.

1. How many fours are in 8? 12? 20? 16? 32? 28? 40? 44? 48? 36? 24? 400? 800? 200? 100?

2. At 4 for a cent, what will 8 apples cost? 12 plums? 20 pears? 16 flowers? 28 pens? 24 cards? 1 doz. eggs?

3. Find ¼ of $8; 12 cents; 20 cows; 28 sheep; 16 acres; 32 yards; 40 minutes.

4. How long would it take 4 men to do a work that one man can do in 12 days? 16 days? 32 days? 24 days?

5. How much have I left after spending ¼ of $8? $12? $20? $16? $24? $32? $40? $400? $360? $240?

6. At $¼ each, what must I pay for 4 books? 8 books? 12 hens? 20 hens? 24 ducks? 16 ducks? 36 knives?

7. What number added to itself 3 times will make $8? $16? £20? £24? 36 sheep? 48 cows? 40 boys?

Exercise 161.

1.	16÷2=	15÷2=	28÷3=	13÷2=	325÷3=
2.	18÷3=	16÷3=	17÷2=	28÷3=	217÷2=
3.	24÷4=	21÷4=	21÷2=	25÷3=	420÷4=
4.	15÷3=	27÷4=	26÷4=	29÷4=	618÷3=
5.	18÷2=	19÷2=	33÷4=	29÷3=	412÷2=
6.	21÷3=	20÷3=	35÷3=	16÷2=	832÷4=
7.	28÷4=	30÷4=	35÷4=	36÷4=	836÷4=

Exercise 162.

1. At $2 each, how many lambs can I buy for $8? $12? $16? $20? $25? $27? $23? $47? $65? $89? $35?

2. What is the largest number which can be subtracted 4 times from 16? 20? 28? 32? 24? 36? 48? 40?

3. What number added to itself 2 times will make 6? 9? 15? 24? 12? 18? 27? 36? 39? 48? 60? 90? 120?

4. How much does each get, when Will shares 8 plums with his three brothers? 12 plums? 20 plums?

5. Will earns 2 cents a day. In how long will he earn 4 cents? 8 cents? 6 cents? 12 cents? 14 cents?

6. How many pears in 3 thirds? 6 thirds? 9 thirds? 15 thirds? 24 thirds? 30 thirds? 45 thirds? 60 thirds?

7. What is the cost of 6 apples @ 12 cents a doz.? 16 cents? 20 cents? 24 cents? 14 cents? 25 cents?

8. What is 25 cents' worth of sugar at 16 lbs. for $1? 20 lbs.? 24 lbs.? 12 lbs.? 32 lbs.? 14 lbs.? 18 lbs.?

Exercise 163.

1. Divide 5 into 10, 15, 25, 30, $20, $35, $40, $30, 25 sheep, 30 cows, 35 hens, 40 acres, 50 pins.

2. How many 5-acre fields equal 10 acres? 20 acres? 15 acres? 25 acres? 35 acres? 45 acres? 40 acres?

3. Find the five equal addends which make 10, 20, 30, 15, $25, $40, $35, £45, £50, 60 sheep, 70 lambs.

4. How many 5-cent stamps can I buy for 10c.? 20c.? 30c.? 40c.? 25c.? 45c.? 35c.? $.55? $.75? $1.25? $2.50?

5. At 5 miles an hour, how long will I be walking 20 miles? 30 miles? 25 miles? 15 miles? 45 miles?

6. How long will it take 7 men to do a work one man does in 14 days? 28 days? 35 days? 42 days? 1 day?

7. Willie gave away $\frac{2}{5}$ of his apples. How many are left out of 15? 20? 30? 25? 40? 60? 50? 55? 45? 75?

8. How many oranges @ 5 cents can I buy for 15 cents? 20 cents? 35 cents? 25 cents? 43 cents?

Exercise 164.

1. What number multiplied by 6 gives a product of 12? 24? 48? 36? 30? 42? 180? 360? 540? 600?

2. How often can 6 be subtracted from 12? 18? 30? 36? 24? 48? 42? 60? 420? 480? 540? 720?

3. How many times $6 is $12? $18? $30? $36? $24? $42? $60? $48? $54? $66? $72? $84? $246? $276?

4. At $1 a day how many weeks would I be earning $18? $24? $36? $48? $30? $60? $54? $42? $66? $84?

5. What is the weight of 1 ham if 6 weigh 24 lbs.? 36 lbs.? 42 lbs.? 48 lbs.? 72 lbs.? 84 lbs.? 96 lbs.?

6. How many weeks in 12 working days? 18 days? 30 days? 24 days? 36 days? 48 days? 27 days?

7. How many hours in 60 min.? 120 min.? 240 min.? 360 min.? 300 min.? 480 min.? 600 min.? 660 min.?

8. How many feet in 16 halves? 21 thirds? 24 quarters? 45 fifths? 63 ninths? 72 eighths? 10 quarters?

Exercise 165.

1. How much is $\frac{1}{7}$ of $14? $7? $21? 35? 42? 63? 49? 28 acres? 35 quarts? 56 inches? 70 yards?

2. How many times 7 boys are 14 boys? 21 boys? 28 boys? 42 boys? 56 boys? 49 boys? 35 boys? 63 boys?

3. How long would it take 7 men to do a work one man can do in 14 days? 28 days? 21 days? 35 days?

4. What is the size of a flock, if in 7 flocks there are 21 sheep? 35 sheep? 49 sheep? 56 sheep? 70 sheep?

5. How many weeks in 7 days? 14 days? 42 days? 35 days? 21 days? 25 days? 30 days? 40 days? 50 days?

6. A boy earns $16 a month and spends $9. How long would he be saving $28? $21? $35? $49? $63?

7. At what price will 7 yards of print cost 49c.? 63c.? 84c.? 70c.? 77c.? $.63? $.56? $.28? $1.40?

8. How many times is 7 contained in 49? 63? 56? 70? 42? 45? 50? 60? 65? 75? 80? 85? 90? 100? 145? 728?

Exercise 166.

1. What is $\frac{1}{8}$ of 8? 16? 24? 40? $32? £40? £48? 56 lambs? 64 cows? 80 horses? 72 lambs? 32 boys?

2. How many sheep at $8 are worth $16? $24? $48? $32? $40? $80? $64? $48? $72? $56?

2. At 8 pounds of sugar for $1, what is the cost of 16 lbs.? 32 lbs.? 24 lbs.? 48 lbs.? 40 lbs.? 64 lbs.

4. At 8 miles an hour how long would a horse take to go 16 mi.? 32 mi.? 24 mi.? 40 mi.? 64 mi.? 80 mi.?

5. What is the share of each, when 3 sons and 5 daughters get $3200? $2400? $4000? $6400? $4800?

6 What is the quotient when the divisor is 8 and the dividend is 16? 24? 48? 32? 40? 80? 64? 72? 96?

7. How many flocks of 8 lambs can be made of 24 lambs? 32 lambs? 16 lambs? 25 lambs? 30 lambs?

8. How long would it take 16 men to do a work 2 men do in 16 days? 22 days? 24 days? 8 days? 72 days?

Exercise 167.

1. What number multiplied by 9 gives 45? 36? $81? $63? £72? £54? 27 yds.? 90 ft.? 180 miles? 918 qts.?

2. How many 9-acre fields in 63 acres? 72 acres? 81 acres? 54 acres? 450 acres? 360 acres? 945 acres?

3. How many eggs @ 9c. a doz. are worth 27c.? 36c.? 18c.? 45c.? $.63? $.72? $.54? $4.50? $3.60? $18? $36?

4. How many times must 9 be taken to make 45? 63? 36? 81? 918? 927? 999? 909? 936? 864? 756? 567?

5. How many times must 9 be added to itself to make 36? 54? 45? 63? 27? 72? 18? 81? 108? 396? 468?

6. At 3 lambs for $27, how many would I get for $18? $81? $27? $72? $45? $54? $369? $396? $963? $936?

7. Find the average of 6 lbs., 8 lbs., 9 lbs., 5 lbs., 6 lbs., 6 lbs., 7 lbs., 4 lbs. and 3 lbs.

8. How often can you subtract 9 from 63? 72? 81? 99? 54? 45? 270? 450? 360? 405? 648? 873?

Analysis.

Exercise 168.

What is the price if:—

1. 4 sheep cost $20? $24? $32? $40? $36? $64? $72?
2. 3 lambs cost $15? $24? $30? $36? $45? $63? $57?
3. 5 calves cost $20? $35? $45? $40? $30? $60? $100?
4. 7 lbs. cost 21c.? 35c.? 28c.? $.63? $.42? $.49? $.56?
5. 8 yds. cost 32c.? 64c.? 48c.? $.72? $.88? $1.28?
6. 6 eggs cost 18c.? 12c.? 54c.? 36c.? $.48? $.24?
7. 7 quarts cost [illegible]? 18c.? 45c.? $.36? $.63? $1.08?

Exercise 169.

1. If 2 sheep cost $8 ($10, $6), what will 3 sheep cost?
2. If 2 books cost 16 (12) cents, what will 4 books cost?
3. I buy 3 lbs. nails for 9 (15) cents. Find cost of 5 lbs.
4. What are 3 stamps worth if 5 cost 25 (15, 20) cents?
5. 4 parcels weigh 20 (12, 16) lbs.; what will 6 weigh?
6. What will 8 pens cost, if 6 pens cost 12 (6, 18) cents?
7. If 2 (4, 5) yds. cotton cost 16 (20, 30) cents, what will 3 (5, 4) yds. cost?
8. If 6 (9, 12) tons of coal cost $42 ($49.50, $78), what must be paid for 7 tons of coal?

Exercise 170.

What is the remainder when you divide each of the following numbers by 2? 4? 3? 6? 8? 9? 7? 5?

1. 359,648,721. 538,462,971. 187,369,524.
2. 432,796,185. 284,396,157. 642,183,975.
3. 875,364,912. 962,471,538. 537,814,296.
4. 768,419,253. 375,246,819. 863,451,792.

Write down the quotient as it is obtained.

Write down each successive remainder.

Exercise 171.

1. If 3 lbs. candy cost 18 (30, 45) c., what will 4 (5, 6) lbs. cost?

2. If 4 lbs. cheese cost 32 (28, 40) c., what will 3 (5, 9) lbs. cost?

3. 5 sheep sell for $15 ($35, $45). What will 7 (6, 8) sheep cost?

4. I paid $16 ($12, $20) for 4 cords wood. Find the cost of 5 (7, 9) cords at the same price.

5. I paid 18 (30, 24) cents for 6 bottles of ink. What should I pay for 8 (7, 9) bottles of ink?

6. If 7 (8, 9) sheep sell for $35 ($64, $54), what will I get for 9 (12, 11) sheep?

7. If 5 (8, 11) men earn $35 ($48, $44), what will 7 (9, 8) men earn in the same time?

8. I earn $48 ($96, $77) in 4 (8, 7) weeks. How much do I earn in 9 (6, 8) weeks?

Exercise 172.

1. If 2 (3, 5) men do a work in 4 (6, 8) days, how long would it take one man to do it?

2. If 8 (3, 4) boys can saw a cord of wood in 3 (5, 7) hours, how long would it take one boy to saw it?

3. How long would it take one man to split a cord of wood, if 2 (5, 8) men do it in 20 (16, 8) minutes?

4. If 4 (6, 9) men do a work in 3 (4, 4) hours, how long should it take 6 (8, 12) men?

5. If 3 (6, 9) girls sew a quilt in 8 (4, 2) hours, how long should 6 (8, 6) girls be sewing it?

6. If 2 (6, 7) men do a work in 10 (4, 5) days, how long is needed by 5 (8, 5) men?

7. If it requires 8 (9, 6) days for 6 (4, 7) men to do a work, in how long would 16 (12, 3) men do it?

8. If 18 (17, 16) lbs. of tea cost $.75 ($1.75, $2.70) more than 15 (12, 10) lbs., how much will 18 lbs. of such tea cost?

Exercise 173.

1. If 5 (6, 8) yards flannel cost $1.00 ($1.80, $2.40), what will 7 (9, 6) yards cost?

2. If 7 (9, 8) yards tweed cost $2.80 ($4.50, $3.60), what must I pay for 8 (7, 11) yards?

3. If 6 (7, 3) books cost $1.50 ($1.05, $.36), what should 5 (9, 8) books cost?

4. If 52 (70, 90) cents pay for 4 (5, 6) books, how much should I pay for 6 (7, 4) books?

5. If $1.80 ($3.20, $4.50) pays for 5 (8, 15) doz. buttons, how many can be bought for $1.50 ($4, $9)?

6. If 15 (20, 21) calves cost $75 ($60, $126), how many calves can I buy for $100 ($200, $150)?

7. If 16 (18, 13) dozen eggs cost $1.28 ($2.70, $1.43), how many can be bought for $8 ($4.50, $22)?

Exercise 174.

1. If 16 (24, 32) men build a barn in 8 (10, 4) days, how long would it take 4 (6, 8) men to build it?

2. If 12 (15, 25) boys saw a pile of wood in 12 (20, 20) days, in what time would 6 (12, 20) boys saw it?

3. How long would it take 7 (12, 8) men to complete a work 21 (24, 60) men could do in 10 (5, 9) days?

4. If 12 (15, 50) boys can do a work in 7 (5, 4) days, in what time would 42 (25, 40) boys do it?

5. How long should 3 (40, 9) boys take to do a work 9 (16, 27) boys can do in 9 (20, 10) hours?

6. In how many weeks would 14 (20, 12) men do a work that 7 (5, 18) men can do in 6 (8, 4) weeks?

7. If 9 (15, 40) boys do a work in 12 (10, 12) days, how long will it take 6 (25, 48) boys to do it?

8. If 3 ducks are worth 4 hens, and 5 geese are worth 10 ducks, find the price of a goose, if hens are worth 75c.

Exercise 175.

1. If 6 (7, 6) men earn $24 ($21, $60) in 4 (3, 5) days, how much should 5 (9, 11) men earn in 5 (2, 3) days?

2. I earn $15 ($28, $42) in 3 (4, 6) days. How much should 9 (7, 5) men earn in 5 (6, 7) days?

3. 3 (5, 6) men earn $6.30 ($25, $15) in 2 days, how much should 8 (4, 5) men get for 5 (3, 6) days?

4. If 3 (2, 3) fields, each 5 (10, 9) acres, cost $300 ($400, $1,080), find cost of 5 fields, each 4 (6, 8) acres.

5. If 4 (7, 9) baskets, each 7 (9, 8) lbs. grapes, cost $1.40 ($4.41, $5.76), what will 5 (6, 8) baskets, each 8 lbs., cost?

6. If 4 (5, 8) caddies, each 5 (6, 5) lbs. tea, cost $8 ($9, $16), find cost of 5 (6, 9) caddies, each 8 (4, 6) lbs.

7. If 5 men working 8 (9, 7) hours a day, do a work in 3 days, how many days of 10 hours would it take 4 men?

Exercise 176.

1. Find the cost of 16 (24, 32) pears @ 4 for 5 cents.

2. Find the cost of 9 (15, 24) sheep @ 3 for $10.

3. If 3 (4, 8) pens cost 10 cents, what will 12 cost?

4. If 5 (10 20) cents pay for 12 pens, how many will 15 cents pay for?

5. If 3 (7, 9) boys earn $10, how much will 12 (14, 36) boys earn?

6. I can walk 10 miles in 3 (4, 6) hours. How far can I walk in 12 hours?

7. If 3 (5, 7) men do a work in 5 (8, 10) days, how many men could do it in 15 (5, 14) days?

8. If $\frac{2}{3}$ ($\frac{3}{4}$, $\frac{2}{5}$) of my money is $10 ($12, $16), how much have I?

9. If $\frac{3}{4}$ ($\frac{4}{5}$, $\frac{5}{6}$) of my flock is 15 (20, 25) sheep, how many sheep have I?

10. If $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{5}$) of a pound of butter cost 12 (8, 9) cents, what will 2 pounds cost?

Exercise 177—Sharing.

1. Divide 24 (36, 84) cents equally between A and B.

2. Divide 48 plums equally among 3 (4, 6, 8) boys.

3. Divide $36 between A and B, so that A may have 2 (3, 5, 8) times as much as B.

4. Divide $48 between B and C, so that C may have ¼ (⅓, ⅕, ⅛) as much as B.

5. Divide 12 (42, 48) cents among A, B and C, giving B 2 (3, 3) times, and C 3 (3, 4) times, A's share.

6. Divide $21 ($49, $63) among A, B and C, so that B may have twice as much as A, and C twice B's share.

7. Divide $40 ($64, $96) among A, B and C, so that B's share may equal C's, and A's may equal both.

8. Divide 28 (63, 84) cherries equally among 4 boys and 3 girls.

9. Divide 56 (66, 63) plums among 2 boys and 3 girls, giving a girl 2 (3, ½) times a boy's share.

Exercise 178.

1. Divide $5 ($15, $25) equally between A and B.

2. Divide $25 ($50, $75) between A and B, so that A may have 3 times as much as B.

3. Divide 21 (24, 36) sheep between A and B, so that A will get 3 (5, 2) as often as B gets 4 (3, 7).

4. Divide 54 cents ($.72, $12) among A, B and C, so that A will have 2 cents as often as B gets 3 cents, and C gets 1 cent.

5. The sum of two numbers is 45 (88, 90). One is 2 (3, 4) times the other. Find each.

6. The sum of three numbers is 77 (81, 99). The first is 2 (3, 4) times the second, and the second is 2 times as great as the third. Find the three numbers.

7. Find the wages of each, if 2 men, 3 women and 4 boys earn $9 ($10.80, $36), and a man earns twice as much as a woman, and a woman twice as much as a boy.

Exercise 179.

1. Divide $9 ($15, $27) between A and B, so that B will have $3 more than A.

2. Divide 28 sheep into 2 flocks, one having 4 (8, 6) sheep more than the other.

3. Divide 47 apples between Will and Rob so that Rob will have 5 (9, 11) less than Will.

4. A and B earned $15 ($27, $45). A earned $5 ($3, $13) more than B. How much did each earn?

5. Divide $28 ($38, $54) among A, B, and C, so that A may have $3 ($2, $3) more than B, and B may have $2 ($3, $3) more than C.

6. Divide $31 ($64, $91) among A, B, and C, so that A may have $5 more than B and $6 less than C.

7. The sum of three numbers is 16 (46, 57). The first is 3 (4, 2) less than the second, but 2 (3, 5) greater than the third. Find the three numbers.

Exercise 180.

1. I bought an equal number of 2-cent, 3-cent and 5-cent stamps, paying $.80 ($3.60, $5). How many of each kind did I buy?

2. I have $84 ($120, $144) in an equal number of $1, $2, $4 and $5 bills. How many bills have I?

3. I have an equal number of 5-cent, 10-cent and 25-cent pieces. If all are worth $1.60 ($2.80, $8) how many coins have I?

4. For 15 (22, 36) cents I can buy 4 peaches and 3 pears, paying two cents more for a peach than a pear. Find price of each.

5. Divide 35 (48, 65) plums among 5 boys and 4 girls, giving each girl 2 (3, 5) more than each boy.

6. A man gets $2 a day more than a boy, and 4 men and 8 boys get $20 ($14, $26) a day. Find wages of each.

7. Geese are worth $1 more than ducks. Find price of each, if 4 ducks and 2 geese cost $5 ($8, $6.50).

Exercise 181.

1. $(6+4)+(3+7)-(5+6)=$ $7\times 8+9\div 3-6\times 4=$
2. $(9-3)+(8+4)-(7-2)=$ $5\times 6+8\times 3-28\div 4=$
3. $(7+6)-(7-3)+(8-6)=$ $(9\times 8)\div(7-3)\div(45\div 9)=$
4. $7+6-7-3+8-6=$ $16\times 12\div 3\times 4\times(36\div 4)=$
5. $7+(8-6)(9-4)-15=$ $(6\times 9)\div(9\div 3)\div(12\div 2)=$
6. $9-6+7-(3+6)+9=$ $(6+9\div 3)(14\times 12\div 84)=$
7. $8-(3+4)-(8-7)+5=$ $(18-12\div 3)(27+36\div 12)=$

Exercise 182.

1. A man is 4 times as old as his son, and the sum of their ages is 30 (35, 45) years. Find age of the son.

2. A man is 5 times as old as his son, and the sum of their ages is 42 (48, 60) years. Find the father's age.

3. A man is 6 times as old as his son, and the sum of their ages is 21 (35, 42) years. Find age of each.

4. I am 7 times as old as my son, and the difference in our ages is 30 (36, 48) years. Find our ages.

5. A boy has 3 (7, 5) sisters and 4 (5, 9) brothers. How many children are in the family?

6. I bought the same number of lambs @ $4 and calves @ $5. How many of each did I buy for $18? $36? $63? $450? $720? $900? $963? $972? $954? $828? $756?

How many animals did I buy?

Exercise 183

1. $(2+3)\times 2=$ $(2\div 2)\times(3+3)=$ $6\times 4+8\div 2-5=$
2. $(7+4)\times 4=$ $(5+2)\times(6-4)=$ $9\times 5+9\div 3-8=$
3. $(7-4)\times 8=$ $(7-4)\times(9-5)=$ $8-2\times 3+16\div 4=$
4. $(9-3)\times 7=$ $(9\times 8)\div(8+4)=$ $(9\times 8-6\times 5)\div 7=$
5. $6\times 4\div 3=$ $(8\times 6)\div(9-6)=$ $(6\times 7)(4\times 12)\div 14=$
6. $6+4\div 2=$ $(8\times 6)\div(6\times 4)=$ $(9-3)(6+4)\div 12=$
7. $8-6\div 2-$ $(9\times 12)\div(6\times 6)=$ $(9-5)(8+6)\div 28=$

Exercise 184.

Find the average of :—

1.	5, 6 and 4.	3, 4, 8 and 5.	4, 5, 6, 9 and 11.
2.	3, 4 and 8.	7, 8, 0 and 9.	2, 7, 8, 9 and 4.
3.	9, 5 and 7.	5, 7, 3 and 9.	1, 9, 5, 4 and 6.
4.	3, 0 and 9.	3, 8, 6 and 7.	7, 8, 0, 9 and 1.
5.	7, 2 and 9.	9, 6, 10 and 3.	7, 6, 3, 1 and 8.

Exercise 185.

1. A man gets $12 ($16, $18) a week. How much can he spend a day and save $2.20 ($3.75, $2.25) a week?

2. How much will I get for 4 dozen oranges at 3 for 5c.? 4 for 5c.? 6 for 5c.? 8 for 5c.?

3. How many rails 9 (8, 11) feet long will be needed to make a straight 6-rail fence 450 (640, 891) feet long?

4. How many rails 11 feet long will be needed to make a straight 7-rail fence around a field 660 ft. long and 440 ft. wide?

5. How many have I left after selling $\frac{2}{3}$ of 15 acres? 24 acres? 36 acres? 45 acres? 75 acres? 750 acres?

6. Sam gave away 6 apples. What part did he give if he had 12 apples? 18 apples? 36 apples? 24 apples?

7. Will sold 8 acres. What part of his farm did he sell, if he has 16 acres left? 24 acres? 32 acres? 64 acres?

8. How many span of horses will need 24 shoes? 48 shoes? 64 shoes? 56 shoes? 96 shoes? 88 shoes?

Exercise 186.

1.	$54 \times 7 \div 18 =$	$28 \times 14 \div 56 =$	$35 \times 24 \div 60 =$
2.	$63 \times 5 \div 21 =$	$36 \times 7 \div 42 =$	$48 \times 25 \div 30 =$
3.	$72 \times 9 \div 27 =$	$51 \times 8 \div 34 =$	$48 \times 27 \div 32 =$
4.	$48 \div 14 \div 42 =$	$35 \times 9 \div 45 =$	$56 \times 15 \div 35 =$
5.	$96 \times 12 \div 64 =$	$32 \times 7 \div 56 =$	$56 \times 15 \div 40 =$
6.	$56 \times 5 \div 70 =$	$49 \times 24 \div 84 =$	$64 \times 9 \div 96 =$
7.	$84 \times 7 = 49 =$	$72 \times 18 \div 81 =$	$75 \times 33 \div 55 =$

Exercise 187.

Fill the blanks properly :—

	Dividend	Divisor	Quotient	Remainder
1.	36 (40, 45)	2 (3, 4)	……	……
2.	35 (40, 45)	5 (6, 7)	……	……
3.	50 (56, 63)	7 (8, 9)	……	……
4.	45 (37, 49)	……	3 (6, 9)	……
5.	36 (45, 50)	……	4 (7, 8)	……
6.	……….	6 (8, 11)	12 (9, 7)	3 (7, 5)
7.	……….	7 (9, 12)	10 (6, 5)	4 (6, 9)

Exercise 188.

1. Find the two equal factors of 4, 9, 25, 16, 49, 36, 81, 64, 100, 144, 121, 400, 900. 1,600, 2,500, 225, 625.

2. I paid $.64 ($1.44, $2.25) for a number of books @ as many cents each. Find the number and the price.

3. What is the square of 99? 97? 49? 89? 69? 101? 102? 103? 201? 202? 35? 45? 85? 75? 115? 125? 195? 395? 999? 9999?

4. Give all the numbers less than 100 which are perfect squares.

5. If 6 (5, 8) times the square root of a number is 42 (66, 72), find the number.

6. I divide the square root of a number by 4, and the quotient is 2 (3, 5). Find the number.

Exercise 189.

Add, subtract, multiply or divide in order.

1. $7\times8+4\div5\times6-2\times2+4\div12\times5+4\div8=$.
2. $9\times7+1\div8\times9+3\div5\times2+6\div6\times7+7+1\div2=$
3. $5\times7+1\div4\times9-1\div10\times6+2\div5\div2\times9\div3=$
4. $8\times4-2\times4+1\div11\times6\div2-1\div8\times7-8\div10\times9=$
5. $6\times7+8\div2\times4-10-9\div9\times5+4\div7\times4+2=$
6. $5\times9-1\div4\times6-2\div8\times9+8\div4\div5\times6+1\times4=$
7. $8\times9+5\div7\times4-2\div7\times3+7\div5\times9+3\div8-6=$

Exercise 190.

Compare in as many ways as you can :—

1.	3 and 5.	2 and 4.	$4 and $6.	$8 and $24.
2.	4 and 7.	3 and 9.	$3 and $7.	$7 and $28.
3.	6 and 8.	4 and 8.	$4 and $9.	$9 and $18.
4.	5 and 9.	2 and 8.	$5 and $8.	$6 and $30.
5.	7 and 9.	3 and 6.	$6 and $9.	$5 add $35.
6.	8 and 7.	3 and 9.	$3 and $18.	$4 and $28.

Exercise 191.

1. I gave 4 (9, 7) nuts to each of 5 (8, 7) boys, and had 7 (3, 5) left. How many could have received 3 nuts?

2. A, walking 28 miles a day, is 27 (33, 63) miles ahead of B. How fast must B walk to overtake A in 3 days?

3. A train 56 (98, 126) yards long is moving 14 yards a second. How long will it be passing a point?

4. I bought 24 sheep for $140 ($175, $236), and sold them for $164 ($233, $188). Find average gain or loss.

5. 7 (3, 4) years ago Will was 3 (9, 8) times as old as Mary. Find Will's age, if Mary is now 12 years old.

6. If 12 hats or 16 caps cost $4.80, find the cost of 4 hats and 6 caps, 16 hats and 12 caps, 15 hats and 15 caps.

7. If a barrel of flour lasts 8 people 6 weeks, how many people would it last one week? 2 weeks? 3 weeks? 4 weeks? 8 weeks? 12 weeks? 16 weeks? 24 weeks?

Exercise 192.

1.	$\frac{1}{2}$ of $12+4=$	$\frac{2}{3}$ of $15+6=$	$\frac{3}{5}$ of $\$20+\$8=$
2.	$\frac{1}{3}$ of $15+6=$	$\frac{3}{4}$ of $16+7=$	$\frac{3}{7}$ of $\$28+\$6=$
3.	$\frac{1}{4}$ of $24+7=$	$\frac{4}{5}$ of $20+8=$	$\frac{5}{8}$ of $\$40+\$7=$
4.	$\frac{1}{5}$ of $25+8=$	$\frac{5}{6}$ of $42-7=$	$\frac{8}{9}$ of $\$45-\$9=$
5.	$\frac{1}{6}$ of $35-3=$	$\frac{4}{7}$ of $42-6=$	$\frac{7}{9}$ of $\$63-\$4=$
6.	$\frac{1}{7}$ of $45-6=$	$\frac{7}{8}$ of $32-9=$	$\frac{3}{8}$ of $\$96-\$8=$
7.	$\frac{1}{8}$ of $72-5=$	$\frac{5}{9}$ of $81-7=$	$\frac{5}{6}$ of $\$96-\$7=$

Exercise 193.

1. What are the factors of a number? Write down 8 numbers, less than 20, which have no factors.

2. Resolve 15 (21, 36, 60) into its prime factors.

3. Write down the composite numbers less than 20.

4. What number taken from 25 will leave a remainder exactly divisible by 4? 6? 8? 7? 9?

5. What number added to 37 will give a multiple of 3? 7? 8? 6? 9? 5? 4? 10?

6. $\frac{9}{10}$ of a score = how many times $\frac{1}{2}$ a dozen?

7. The product of two numbers is 175 (450, 729). One of them is 5 (15, 9). Find the other.

8. What number divided by 5, and the quotient divided by 6, and that quotient divided by 8, gives a result of 12?

Exercise 194.

1. How many strokes does a clock, striking the hours, strike in 12 hours? 1 day? 1 week?

2. How much fringe will be needed for a table-cloth 9 (8, 12) feet long and 6 (7, 8) feet wide?

3. B's age is 7 (5, 8) times C's age. Find age of each if the sum of their ages is 32 (42, 54) years.

4. How old am I if 4 times my age + 7 times my age is 44 years?

5. A runs 10 (15, 20) yards while B runs 8 (12, 19) yards. How far will B be behind in a 100-rod race?

6. A has $7.50 ($4.80, $15) and B has $\frac{2}{3}$ ($\frac{3}{4}$, $\frac{1}{2}$) as much. How much have the two?

7. If 4 (5, 6) men can mow a field in 5 (8, 7) days, how many men can mow 4 fields in 10 (8, 21) days?

8. Charlie shares 30 (36, 66) cherries equally with his 3 brothers and 2 sisters. Find share of each.

9. A boy buys apples at 5 cents a dozen and sells them at 3 (3, 6) for 2 (5, 5) cents. What is his gain on 3 dozen? 6 dozen? 84 apples? 108 apples?

Exercise 195.

1. $36 \div 4 = 9$. Name each of the parts of this question, and show the relation of each to the other.

2. When can subtraction questions be worked by division? Show that addition and multiplication are the converse of subtraction and division.

3. What does the quotient represent?

4. What is the greatest possible remainder?

5. Given divisor, quotient, remainder: find dividend.

6. Of what number is 7 both divisor and quotient?

7. What is the dividend, if quotient and divisor are 35, and the remainder the greatest possible?

8. How could you verify your answer in division?

9. How is the average of two or more numbers found?

10. Show how to find the complete remainder when using factors in division.

11. Distinguish short division from long division.

12. Distinguish a power of 10 from a multiple of 10. How is the power of a number indicated?

13. What is analysis in arithmetic?

14. If 2 cents (3 feet, 4 gallons) is the unit of measurement, what is represented by 3? 4? 5?

15. Find the number which will represent 24 feet, when the unit of measurement is 2 (3, 4, 6, 8) feet.

16. Place three 6's together in such a way as to equal 18, 6, 30, 42, 2, 0, 7, 5.

17. How can you tell by inspection whether a number is a multiple of 2? 4? 8? 3? 6? 9? 5? 10? 7? 11?

18. Show that $\$20 \div 4 = \$5$; and $\frac{3}{4}$ of 16 eggs = 12 eggs.

19. What is cancellation?

20. What are the prime factors of a number? How would you find the prime factors of a large number?

21. Divide the sum of 24 and 36 by their difference.

22. Divide the product of 45 and 63 by 35.

WEIGHTS AND MEASURES.

A **Number** is a unit, or a collection of units. The unit may be a single object, or a group of objects.

An **Abstract** number is one in which the kind of unit is not named. It is used without referring to any object.

A **Denominate** or **Concrete** number is one in which the kind of unit—the **unit of measure,** or the **denomination**—is named.

A **Measure** is a standard unit, used in estimating the amount of anything.

Our **Standard Units** are :—

of *time* = 1 day.
of *value* = $1 or £1.
of *length* = 1 yard.
of *surface* = 1 sq. yd.
of *solidity* = 1 cub yd.
of *capacity* = 1 gallon.
of *weight* = 1 pound.

A **Simple** number is of one denomination.

A **Compound** number is composed of more than one denomination of the same nature.

Similar numbers are those of the same denomination.

An **Aliquot Part** of a number is a factor of it : as 6 is of 12 ; 25 cents is of $1 ; 5*s*. is of £1.

Reduction is the process of reducing a number to one of some other denomination.

Reduction **Descending** is the process of reducing a number to one of a lower denomination without altering the value.

Reduction **Ascending** is the process of reducing a number to one of a higher denomination.

Simple addition, subtraction, multiplication or division is the process of adding, subtracting, multiplying or dividing simple numbers.

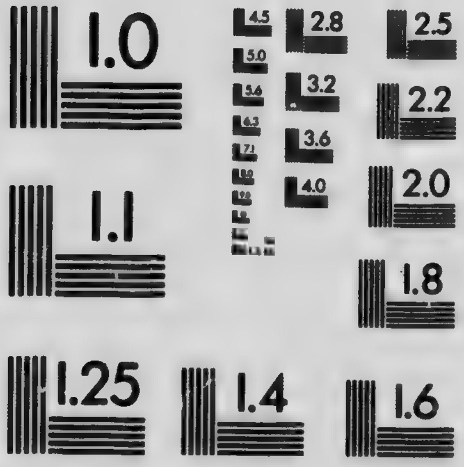
Compound addition, subtraction, multiplication or division, is the process of adding, subtracting, multiplying or dividing, compound numbers.

The **dimensions** of anything is its measurements according to the standard unit of length.

The *multiplier* must always be an abstract number. The *divisor* may be abstract or denominate, simple or compound.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 – 0300 – Phone
(716) 288 – 5989 – Fax

Exercise 196 – Canadian Money.

1. What is the value of a cent? a dollar? a mill?

2. How many cents in $1? $2? $3? $5? $20? $25? $1.25? $1.75? $2.45? $3.65? $20.75? $10.09?

3. How many mills in 3 cents? 5 cents? 8 cents?

4. How many cents in 10 mills? 20 mills? 50 mills? 45 mills? 55 mills? 73 mills? 94 mills? 645 mills?

5. Express 8345 mills in dollars and cents.

6. Will has 45 cents; May, 37 cents; Rob, 56 cents, and Alice 75 cents. How much money have they all?

7. Find the sum of $1.75, $1.38, $2.47, and $6.99.

8. From $10 take $1.25, $3.45, $2.87, $5.54, $4.99.

9. Find cost of 4 (6, 5, 8, 9, 7) books @ $1.25 each.

10. 4 (5, 6) books cost $1.20. Find cost of 7 books.

Exercise 197.

1. $\frac{1}{2}$ ($\frac{1}{3}$, $\frac{1}{4}$) lb. sugar costs 3 cents. Find cost of 4 lbs.

2. If $\frac{2}{3}$ ($\frac{3}{4}$, $\frac{4}{5}$) lb. butter costs 12 cents, find cost of 2 lbs.

3. How many 10-cent pieces equal 20c.? 30c.? 80c.? $.70? $1.50? $2.40? $3? $7? $9? $15? $25?

4. How many books @ 25 cents can I get for $1.25? $1.75? $2.25? $3.75? $4.25? $5.50? $10.25? $25.25?

5. What part of $1 is 50c.? 25c.? 75c.? 20c.? 10c.?

6. How many books @ $.75 ($.48) can I buy for $10?

7. How many lambs at $2.25 can I buy for $4.50? $6.75? $9? $36? $7? $8? $15? $20? $40?

8. I have 40c. and Will has $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$) as much. How much has Will? How much have both of us?

9. A book cost $.75 and a pen $\frac{1}{3}$ ($\frac{1}{5}$, $\frac{3}{5}$) as much. Find the cost of both.

10. I have $12, in an equal number of 5-cent, 10-cent, 20-cent, and 25-cent pieces. How many coins are there?

.... × 4 = $1.75 × 12.
.... × 12 = $3.75 × 8.
$4.50 × 8 = $2.25 × ....
$7.50 × 6 = $3.75 × ....

Exercise 198 – United States Money.

1. Name the American coins—gold, silver, other. Give value of each. What other money is used?

2. How many cents in 2 dimes? 3 dimes? 8 dimes?

3. How many dimes in 20 cents? 30c.? 50c.? 80c.? 25c.? 35c.? 75c.? 83c.? 64c.? 97c.?

4. How many dimes (cents, mills) in \$1? \$3? \$5? \$9? \$1.35? \$1.65? \$2.25? \$3.25? \$5.63? \$1.375? \$2.875?

5. How many dollars in 20 dimes? 30 dimes? 60 dimes? 35 dimes? 45 dimes? 85 dimes? 54 dimes? 69 dimes?

6. How many dollars in 2 eagles? 4 e.? 8 e.? 10 e.?

7. How much must I get for a hat that cost \$4.25 to gain \$1.50 (\$2.75, \$3.35)? To lose \$.35 (\$.28, \$.69)?

8. I buy fruit for \$7.25, and sell it at a loss of \$1.50 (\$2.75, \$3.35). How much do I get for it?

9. I earn \$9 (\$15, \$21) a week. Find my daily wages.

10. I spend \$3.50 (\$10.50) a week; how much a day?

Exercise 199.

1. From \$20 take \$9.74, \$4.35, \$6.99, \$12.33, \$14.87.

2. How much do I gain or lose by buying for \$15.35 and selling for \$13.85? \$17.15? \$16.73? \$14.48?

3. Find my weekly wages @ \$1.75, (\$2.25, \$3.45) a day?

4. Find my year's wages @ \$45 (\$75, \$125) a month.

5. 15 lbs. sugar @ 20 (25, 24) lbs. for \$1 =

6. 12 (18, 20) lbs. rice @ 15 lbs. for \$1 =

7. Find $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{4}{5}$, $\frac{3}{5}$, $\frac{2}{5}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$) of \$1.

8. Find cost of 24 books @ \$$\frac{1}{4}$, @ \$$\frac{1}{3}$, @ \$$\frac{3}{8}$, @ \$$\frac{5}{6}$, @ \$$\frac{11}{12}$.

9. Find cost of a book @ 35c., and a lamp @ 4 (7, 9) times as much.

10. How many letters can I post for 24c.? 36c.? 75c.?

11. How many times can I spend 75c. from 1 eagle.

12. A has \$3.75 more than B, and together they have \$8.25 (\$12.35, \$12.45). How much has each?

Exercise 200—English Money.

1. What is a penny? a shilling? a pound? a farthing? a sovereign? a guinea? a crown?

2. How many farthings in 1*d.*? 2*d.*? 3*d.*? 4*d.*? 5*d.*? 1¼*d.*? 1½*d.*? 1¾*d.*? 2½*d.*? 3¼*d.*? 6¼*d.*? 7½*d.*?

3. How many pence in 8 far.? 16 far.? 24 far.? 25 far.? 30 far.? 21 far.? 35 far.? 50 far.? 75 far.?

4. How many pence in 1*s.*? 2*s.*? 5*s.*? 4*s.*? 9*s.*? 10*s.*? 1/-? 2/-? 5/-? 2/6? 3/4? 5/9? 6/8? 13/4? 17/6?

5. How many shillings equal 12*d.*? 24*d.*? 48*d.*? 72*d.*? 20*d.*? 30*d.*? 40*d.*? 80*d.*? 5 six-pences? 15 four-pences?

6. How many shillings in £1? £2? £3? £8? £12? £1 10*s*? £2 10*s.*? £3 5*s.*? £4 15*s.*? £8 12*s.*?

7. Find the sum of 9*d.*, 6*d.*, 8*d.*, 7*d.*, 4*d.*, 5*d.* and 10*s.*

8. How much is 2¼*d.*, 3½*d.*, 2¾*d.*, 6¼*d.*, 8¼*d.*, and 7½*d.*?

9. Add 2*s.* 6*d.*, 3*s.* 4*d.*, 9*s.* 5*d.*, 6*s.* 8*d.*, and 3*s.* 9*d.*

10. How much is £1 10*s.* 9*d.* and £2 16*s.* 9*d.*? £3 10*s.* 8*d.*, £5 6*s.* 4*d.*, and £3 16*s.* 9*d.*?

Exercise 201.

1. From £1 take 6*s.* 4*d*; 12*s.* 6*d.*; 7*s.* 9*d.*; 13/4.

2. At 2¼*d.* a lb., find cost of 12 (24, 36, 72, 50) lbs.

3. What is the cost of:—

5 cans @ 2*s.* 6*d.*?
9 cans @ 7*s.* 6*d.*?
7 cans @ 3*s.* 4*d.*?
4 yds. @ 13/4?
5 yds. @ 17/6?
9 yds. @ 6/8?
7 cows @ £4 10*s.*?
8 cows @ £5 11*s.*?
6 cows @ £6 15*s.*?

4. Multiply £1 6*s.* 8¼*d.* by 2 (3, 4, 5, 6).

5. Find ½ (¼, ¾) of 1*d.*; 1*s.*; £1; 1 cr.; 1 sov.; 1 g.

6. Divide £16 16*s.* 8½*d.* by 2 (4, 3, 5, 6).

7. How many six-pences in 1*s*? 3*s.*? 3*s.* 6*d.*? 7*s.* 6*d.*? How many crowns in £1? £5? 10 sov.? 5 g.?

8. How many books @ 2*s.* 6*d.* can I buy for 7*s.* 6*d.*? 2*s.* 6*d.*? 17*s.* 6*d.*? 10*s.*? 15*s.*? £1 10*s.*? £2 15*s.*?

9. If a herring and a half cost a penny and a half, how many should I get for 1*s.*? 5*s.*? £1? £1 10*s.*?

Exercise 202 – Liquid Measure.

1. Give the table which shows the relation between gills, pints, quarts and gallons.

2. How many gills in 2 pints? 3 pts.? 5 pts.? 8 pts.?

3. How many pints in 2 quarts? 3 qts.? 5 qts.? 9 qts.? 4 qts., 1 pt.? 6 qts., 1 pt.? 8 qts., 1 pt.? 9 qts., 1 pt.?

4. How many quarts in 1 gallon? 3 gal.? 5 gal.? 9 gal.? 3 gal., 1 qt.? 4 gal., 2 qts.? 6 gal., 3 qts.? 9 gal., 3 qts.?

5. How many gallons in 8 qts.? 12 qts.? 24 qts.? 10 qts.? 15 qts.? 25 qts.? 35 qts.? 45 qts.? 50 qts.?

6. How many quarts in 6 pints? 8 pts.? 12 pts.? 7 pts.? 9 pts.? 15 pts.? 25 pts.? 35 pts.? 49 pts.?

7. How many gallons in 15 pints? 25 pts.? 35 pts.?

8. Reduce 3 gal., 3 qts., 1 pt. to a simple number.

9. Compare 1 gal. and 1 qt.; 1 qt. and 1 pt.

10. I drink a pint of milk a day. How much milk do I drink in a week? 2 weeks? 5 weeks?

Exercise 203.

1. One cow gave 3 gal. 2 qts. 1 pt., another 4 gal., 3 qts. and a third 3 gal., 1 pt. How much did all give?

2. A milkman had 12 gal., 1 qt., 1 pt. of milk and sold 9 gal. 3 qts. How much has he left?

3. Find the cost of 4 (5, 8) gallons @ 2c. a pt.

4. Find the cost of 16 (32, 48) pints @ 25c. a gal.

5. At 6c. a qt., what is the cost of 4 gal., 1 pt.? 3 gal., 3 qts., 1 pt.? 9 gal., 2 qts.? 7 gal., 1 qt., 1 pt.?

6. Find $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{5}{16}$) of a gallon.

7. A tumbler holds 2 gills. How much milk would fill 20 tumblers? 30 tumblers? 45 tumblers? 48 tumblers?

8. How many pint bottles will hold 4 gal., 3 qts., 1 pt.? 5 gal., 1 qt., 1 pt.? 7 gal., 2 qts., 1 pt.? 9 gal., 1 pt.?

9. Find the weekly cost of 1 pt. (1 qt., 1 gal.) of milk each morning @ 3c. a pt.

Exercise 204 Dry Measure.

1. How many gallons in 1 peck? 3 pks.? 5 pks.? 3 pks., 1 gal.? 4 pks. 1 gal.? 9 pks., 1 gal.?

2. How many pecks in 1 bushel? 2 bu.? 6 bu.? 2 bu., 1 pk.? 5 bu., 2 pks.? 8 bu., 3 pks.? 16 bu., 3 pks.?

3. How many gallons in 1 bushel? 3 bu.? 6 bu.?

4. How many quarts in 1 peck? 2 pks.? 8 pks.?

5. What simple number equals 5 gals., 1 qt.? 5 bu., 1 gal.? 5 pks., 1 gal., 3 qts.? 1 bu., 1 qt.? 3 pks., 1 pt.?

6. How many pints in 1 qt.? 1 gal.? 1 pk.? 1 bu.?

7. How many qts. in 1 ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{4}$, $\frac{7}{8}$) of a peck?

8. Find value of a bushel @ 10c. a gal. @ 4c. a qt.

9. Find value of a bu. of cranberries at 6 pts. for 24c.

10. Find cost of 1$\frac{1}{2}$ (2$\frac{1}{4}$, 3$\frac{3}{4}$) bu. beans at 5c. a qt.

11. How many quarts of chestnuts should I get for $.72 when selling @ $1.28 ($2.56, $1.92) a bushel?

Exercise 205.

1. In two ways, compare 1 gallon and 1 pint.

2. A horse gets $\frac{1}{2}$ gal. of oats each feed. How many days will 3 (5, 8) bushels last him?

How many pecks will he eat in a week?

3. Find the sum of 5 bu., 3 pks., 1 gal.; 2 bu., 2 pks., 1 gal., and 3 bu., 1 pk., 1 gal., 3 qts.

4. From 8 bu., 2 pks., take 5 bu., 1 pk.; 3 bu., 3 pks.; 2 bu., 2 pks., 1 gal.; 3 bu., 3 pks., 1 gal., 2 qts.

5. How much grain is in 5 (7, 8) bags, each containing 2 bu., 1 pk., 1 gal., 3 qts., 1 pt.?

6. Divide 16 bu., 3 pks., 1 gal., 3 qts., 1 pt. by 2 (4, 8).

7. How many bags, each containing 2 bu., 3 pks., can be filled from 22 bu.? 33 bu.? 13 bu., 3 pks.?

8. If 8 bushels apples are worth $4.80, what is the cost of 3 pecks? $\frac{1}{2}$ bushel? $\frac{1}{4}$ bushel?

9. Find the gain or loss on buying 5 (8, 12) bu. nuts @ 8 cents a quart, and selling @ 5 cents a pint.

Exercise 206 - Table of Time.

1. How many seconds in 2 minutes? 3 min.? 5 min.? 1 min., 5 sec.? 3 min. 10 sec.? 6 min., 25 sec.?

2. How many minutes in 1 hour? 4 hrs.? 8 hrs.? 2 hrs., 10 min.? 4 hrs., 20 min.? 7 hrs., 35 min.?

3. How many hours in 120 min.? 240 min.? 420 min.? 160 min.? 255 min.? 625 min.? 765 min.? 885 min.?

4. How many hours in 1 day? 2 d.? 5 d.? 6 d.? 8 d.? 2 d., 3 hrs.? 2 d., 8 hrs.? 3 d., 10 hrs.? 4 d., 12 hrs.?

5. How many days in 48 hrs.? 72 hrs.? 120 hrs.? 55 hrs.? 80 hrs.? 115 hrs.? 140 hrs.? 258 hrs.?

6. How many days in 1 week? 3 wks.? 8 wks.? 2 wks., 3 d.? 3 wks. 5 d.? 4 wks., 6 d.? 7 wks., 4 d.?

7. How many weeks in 14 days? 28 d.? 49 d.? 77 d.? 30 d.? 40 d.? 67 d.? 88 d.? 75 d.? 728 d.? 763 d.?

8. How many months in 1 year? 3 yrs.? 5 yrs.? 2 yrs., 3 mo.? 2 yrs., 7 mo.? 3 yrs., 8 mo.? 6 yrs., 9 mo.?

Exercise 207.

1. Find the sum of 6 hrs., 20 min., 30 sec.; 5 hrs., 30 min., 50 sec.; and 8 hrs., 29 min., 35 sec.

2. Find the sum of 5 wks., 6 d., 15 hrs.; 4 wks., 5 d., 12 hrs.; 6 wks., 4 d., 9 hrs.; and 3 wks., 6 d., 12 hrs.

3. From 9 wks., 4 d., 15 hrs., take 4 wks., 3 d., 12 hrs.; 5 wks., 5 d., 9 hrs.; 7 wks., 5 d., 20 hrs.

4. What time does a person work a week, whose daily time is 5 hrs., 20 min.? 6 hrs., 15 min.? 8 hrs., 25 min.?

5. How much sleep would a person get a week, from 10 p.m. to 5 a.m. a day? to 5.30 a.m.? to 5.45 a.m.?

6. How much is $\frac{1}{2}$ ($\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{9}$, $\frac{1}{10}$) of a week?

7. Divide 6 wks., 4 d., 8 hrs., 24 min., by 2 (3, 4, 5).

8. How many times is 3 hrs., 20 min. contained in 6 hrs., 40 min.? 13 hrs., 20 min.? 23 hrs., 20 min.?

9. A person is awake 15 hrs., 45 min. a day. In how many days does he sleep 24 hrs, 45 min.? 16 hrs., 30 min.? 41 hrs., 15 min.? 49 hrs., 30 min.? 33 hrs.?

Exercise 208.

1. How much less than a year is 3 mo.? 9 mo.? 7 mo.?

2. How many months in $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{6}$, $\frac{5}{6}$) of a year?

3. How many seconds in $1\frac{1}{2}$ ($2\frac{1}{4}$, $3\frac{3}{4}$) minutes?

4. How many weeks in 1 yr.? $\frac{1}{2}$ yr.? $\frac{1}{4}$ yr.? $\frac{3}{4}$ yr.?

5. Find my yearly wages @ \$10 (\$8, \$24) a week.

6. How many days (working days, school days) in 1 week? 2 wks.? 4 wks.? 3 wks.? 8 wks.? 11 wks.?

7. From $\frac{7}{8}$ of an hour take $\frac{1}{2}$ ($\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$) of an hour.

8. Missed 4 days in 9 (7, 11) weeks' school. Find my attendance.

9. Find my weekly wages @ \$1.25 (\$1.50, \$2.25) a day.

10. How much a week must I pay for my board @ \$1.25 (\$1.50, \$2.25) a day?

11. I walk 4 mi. an hour. How far do I go in 30 min.? 15 min.? 45 min.? 75 min.? 90 min.? 150 min.? 7 hrs., 45 min.?

Exercise 209.

1. How many days in the calendar months?
Name the last day of this century.
Name the leap years in this century.

2. How many days from Jan. 8 to Feb. 15? Mar. 14 to Apr. 25? May 23 to June 27? July 15 to Sep. 24?

3. How many weeks from Jan. 15 to Feb. 5?

4. Which two successive months have 62 (60) days?

5. Give the dates of the Sundays (Tuesdays, Fridays) of January, if the month begins on Wednesday.

6. How many Saturdays in the month if:—
August 1 is a Monday? a Wednesday? a Friday?
June 1 is a Tuesday? a Sunday? a Saturday?

7. If Mar. 15 is Sunday, on what day of the week will Apr. 18 (May 1, May 24) occur, the same year?

8. At \$2 a day, find my wages for Sep. (Dec., Feb.) if the month begins on Saturday (Wednesday, Friday).

Exercise 210—Avoirdupois Weight.

1. In a table, show the relation of tons, hundredweights, pounds, and ounces.

2. How many oz. in 2 lbs.? 3 lbs.? 4 lbs.? 6 lbs.?

3. How many lbs. in 32 oz.? 64 oz.? 80 oz.? 128 oz.? 25 oz.? 75 oz.? 85 oz.? 100 oz.? 165 oz.? 330 oz.?

4. How many lbs. in 1 cwt.? 2 (3, 5, 7, 9, 11) cwt.?

5. How many cwt. in 1 ton? 2 (4, 8, 12, 6, 3, 9) tons?

6. How many lbs. in 1 ton? 3 (6, 9, 12, 4, 8, 5) tons?

7. Express as simple numbers:—2 t., 3 cwt., 18 lbs.; 3 t., 15 cwt.; 6 t., 14 cwt., 20 lbs.; 9 cwt., 3 lbs., 8 oz.

8. Find the sum of 3 t., 15 cwt., 26 lbs.; 2 t., 14 cwt.; 5 t., 24 lbs.; 4 t., 10 cwt., 18 lbs.; and 3 t., 6 cwt., 36 lbs.

9. From 8 tons take 3 t., 14 cwt., 48 lbs., 10 oz.

10. Find weight of 5 bars each 16 cwt., 75 lbs., 12 oz.

11. What is $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{8}$, $\frac{5}{8}$, $\frac{7}{8}$) of a lb.? a cwt.? a ton?

Exercise 211.

1. What part of a lb. is 8 oz.? 4 oz.? 2 oz.? 6 oz.?

2. Find cost of 4 (8, 12) lbs. sugar at 16 lbs. for $1.

3. How many 2 (4, 8) oz. packages will weigh 2 cwt.?

4. How many packages, each 2 lbs., 8 oz., in 15 lbs.?

5. 4 qts. oats weigh 4 lbs., 4 oz. Find weight of 1 bu.

6. Which is the dearer, 3 cents a lb., or $2.75 a cwt.?

7. Bought hay @ $15 a ton and sold @ 85c. a cwt.
What is my gain on 1 cwt.? 1 ton? 10 tons?
How much did I buy if my gain was $30?

8. If 5 oz. tea cost 15 cents, find the cost of 10 lbs.

9. A grocer's pound-weight is 1 oz. light. How much is my loss on 64 lbs.? 4 cwt.? 80 cents? $48.

10. Find cost of:—
6 tons, 1250 lbs. coal @ $4.80 ($3.60, $4.40) a ton.
9 cwt., 25 lbs. flour @ $3 ($3.20, $4.80) a cwt.
3 tons 3 cwt. bran @ $10 ($15, $12) a ton.
7 lbs., 4 oz. cheese @ 12 (16, 20) cents a lb.

Exercise 212—Troy Weight.

1. For what purpose is Troy weight used?
2. How many grains in one dwt.? 2 (3, 4, 5, 6, 7) dwt.?
3. How many dwt. in 1 oz.? 2 (4, 6, 8, 12) oz.?
4. How many oz. in 1 lb.? 2 (3, 5, 7, 9, 11) lbs.?
5. Reduce 48 (96, 120, 150, 130, 160) grs. to dwt.
6. Reduce 40 (60, 80, 120, 50, 95, 87) dwt. to oz., etc.
7. How many lbs. in 24 (48, 96, 80, 70, 65) oz.?
8. Find weight of 12 spoons each 1 oz., 7 dwt., 12 grs.
9. Divide 8 lbs., 6 oz., 10 dwt., 15 grs. by 2 (3, 4, 5).
10. Find the cost of 1 oz. of silver at 3c. a dwt.
11. Find the cost of a dwt. of gold at $20 an ounce.
12. Alloy is 5 dwt. in the oz. How much silver is in a mug that weighs 8 oz.? 12 oz., 8 dwt.? 6 oz., 12 dwt.?
13. Which is the lighter, a pound of gold or a pound of lead? A pound of medicine or a pound of silver?

Exercise 213—Apothecaries' Weight.

1. For what purpose is Apothecaries' weight used?
2. Write down the table of Apothecaries' weight.
3. Reduce 1 lb. Apoth. to oz.; to drs.; to sc.; to grs.
4. How many grs. in 4 sc., 8 grs.? 9 sc., 7 grs.?
5. How many sc. in 5 drs., 2 scr.? 8 drs., 1 sc.?
6. How many drs. in 3 oz., 5 drs.? 7 oz., 6 drs.?
7. How many 3-gr. powders can be made of 1 oz.?
8. Find weight of 3 (5, 20) powders, each 1 sc., 15 grs.
9. Find cost of 2 lbs., 8 oz. at 5 (6, 8) cents a dram.
10. Find value of 12 oz., 6 drs. at 12 (20) cents an oz.
11. If $\frac{2}{3}$ of 15 scruples of medicine cost 10 (20, 15) cents, what is the value of 12 lbs.?
12. Express as simple numbers:—

1 lb., 3 oz., 4 drs.
2 lbs., 6 oz., 7 drs.
4 lbs., 2 oz., 5 drs.

7 oz., 4 drs., 2 sc.
8 oz., 6 drs., 1 sc.
6 oz., 2 drs., 2 sc.

6 drs., 2 sc., 10 grs.
8 drs., 1 sc., 15 grs.
4 drs., 1 sc., 16 grs.

Exercise 214 – Linear Measure.

1. How many inches in 1 foot? 2 ft.? 3 ft.? 5 ft.? 2′ 3″? 3′ 4″? 4′ 6″? 5′ 6″? 6′ 9″? 8′ 7″? 9′ 5″?

2. How many feet in 24 inches? 36 in.? 60 in.? 72 in.? 40 in.? 50 in.? 65 in.? 75 in.? 43 in.? 94 in.? 87 in.?

3. How many feet in a yard? 2 yds? 4 yds.? 8 yds.? 2 yds., 1 ft.? 3 yds., 2 ft.? 4 yds., 2 ft.? 5 yds., 1 ft.?

4. How many yards in 3 feet? 9 ft.? 12 ft.? 18 ft.? 10′? 16′? 20′? 25′? 35′? 40′? 50′? 70′? 80′?

5. How many yards in 1 rod? 2 rds.? 4 rds.? 6 rds.? 3 rds.? 5 rds.? 7 rds.? 9 rds.? 11 rds.? 15 rds.? 21 rds.? 2 rds., 3 yds.? 4 rds., 5 yds.? 3 rds., 2 yds.?

6. How many rods in 11 yards? 22 yds.? 33 yds.? 15 yds.? 25 yds.? 35 yds.? 48 yds.? 57 yds.? 70 yds.? 17 yds.? 18 yds.? 20 yds.? 30 yds.? 40 yds.? 42 yds.?

7. How many rods in a mile? 2 mi.? 3 mi.? 4 mi.? 1 mi., 50 rds.? 1 mi., 80 rds.? 1 mi., 160 rds.?

Exercise 215.

1. What simple number is equal to:—

3 yds., 5 in.? 4 rds., 2 yds., 2 ft.? 1 mi., 240 yds.?
5 yds., 7 in.? 5 rds., 4 yds., 2 ft.? 2 mi., 150 yds.?

2. A field is [30 rds. × 40 rds.]. Explain this expression.

3. How much fringe would trim a tablecloth [6′ × 4′]? [8′ × 12′]? [4′ 6″ × 5′ 6″]? [5′ 4″ × 7′ 8″]?

4. How long a fence would enclose a field:—
[20 rds. × 30 rds.]? [24 rds. × 36 rds.]? [25 rds. × 45 rds.]?

5. How many posts 8′ apart will be needed for a straight fence of 64 ft.? 96 ft.? 40 yds.? 80 rds.? 1 mi.?

6. How many posts 8′ apart will be needed for a fence for a field [64′ × 80′]? [96 yds. × 120 yds.]?

7. How much wire will be required for a 6-strand fence around a field [64 yds., 1 ft., 9 in. × 35 yds., 1 ft., 3 in.]?

8. How many 3″ pickets placed 3″ apart will be used to fence a field [236′ × 264′]? [144 yds. × 156 yds.]?

Exercise 216.

1. How long is a size? a hand? a span? a fathom? a pace? a league? What is each used to measure?

2. How many telegraph poles, 16 rods apart, will reach a mile? 2 miles? 3 miles? 5 miles?

3. How many revolutions will a wheel 16½ feet in circumference make in going 1 (2, 3) miles?

4. A fence around a field 20 (25, 15) rods wide, is 100 rods long. How long is the field?

5. How many strips of carpet 3′ (2′ 5″) wide is needed for a room 9′ (18′, 27′) wide?

6. Rooms are [9′ × 12′]; (12′ × 15′]; [15′ 9″ × 11′ 3″].
How much moulding is needed for walls of each room?
How many strips of 18″ wall paper will each room need?
How many strips of carpet 2′ 3″ wide will each room take?
Find cost of the carpet at $.50 ($.75, $1.25) a yard.
Find cost of border carpet @ $.75 ($1, $1.25) a yard.

Exercise 217.

1. Multiply 5 rds., 3 yds., 2 ft., 9 in. by 2 (3, 4).

2. Divide 12 rds., 4 yds., 1 ft., 6 in. by 2 (3, 5).

3. Find the rate per hour, in taking [illegible]6 steps, each 2′ 8″ long a minute.

4. How much carpet will be needed for a stairs of 18 steps, each 12 inches wide and 8 inches high?

5. If 16 rds., 3 yds., 3 ft., 8 in. of a 60-rod fence was blown down, how much remained standing?

6. How long a chain could be made of three chains 9 yds., 2 ft., 8 in.; 7 yds., 1 ft., 9 in., and 8 yds., 2 ft., 7 in.?

7. Find in lower denominations $\frac{1}{5}$ ($\frac{1}{7}$, $\frac{1}{9}$) of a mile.

8. An inch is what part of a foot? of a yard?

9. Find the cost of 6 (8, 12) strips of carpet, each 8 yds., 2 ft., 6 in. long, @ 75 cents a yard.

Exercise 218—Surface Measure.

1. What is a square? a square inch? a square foot?

2. How many blocks an inch square would cover a paper [3″ × 1″]? [3″ × 4″]? [5″ × 6″]? [12″ × 12″]? [1′ × 1′]?

3. How many stones one foot square would cover a space [5′ × 6′]? [7′ × 8′]? [6′ × 9′]? [9′ × 12′]?

4. How many square feet of lumber will make a floor [8′ × 9′]? [9′ × 12′]? [12′ × 15′]? [12½′ × 16′]? 1 yd. × 1 yd.?

5. What is the length of a floor 8′ wide, containing 96 sq. ft.? 128 sq. ft.? 14[illegible] sq. ft.? 168 sq. ft.?

6. How much land is in a field [10 rds. × 16 rds.]? [16 rds. × 20 rds.]? [20 rds. × 24 rds.]? [40 rds. × 40 rds.]?

7. Two well-proportioned fields of different measurements contain 300 sq. rds. What are the dimensions of each?

8. I have 11 pieces of paper of different sizes, each having a surface on one side of 360 sq. in. Find the sizes.

9. Find the area of a square 6″ (9′, 8 yds., 12 rds.) long.

Exercise 219.

1. How many sq. in. in 1 sq. ft.? 2 sq. ft.? 3 sq. ft.? 5 sq. ft.? 1 sq. ft., 36 sq. in.? 1 sq. ft., 44 sq. in.?

2. How many sq. ft. in 288 sq. in.? 432 sq. in.? 200 sq. in.? 300 sq. in.? 400 sq. in.? 600 sq. in.?

3 How many sq. ft. in 1 sq. yd.? 2 sq. yds.? 4 sq. yds., 5 sq. ft.? 5 sq. yds., 8 sq. ft.?

4. How many sq. yds. in 18 sq. ft.? 36 sq. ft.? 30 sq. ft.? 40 sq. ft.? 58 sq. ft.? 69 sq. ft.? 80 sq. ft.?

5. How many sq. yds. in 1 sq. rd.? 4 sq. rds.? 5 sq. rds.? 9 sq. rds.? 2 sq. rds.? 6 sq. rds.? 3 sq. rds.?

6. How many sq. rds. in 1 acre? 2 ac.? 3 ac.? 4 ac.? 1 ac., 40 sq. rds.? 1 ac., 80 sq. rds.? 2 ac., 120 sq. rds.?

7. How many sq. rds. in 121 sq. yds.? 242 sq. yds.? 70 sq. yds.? 85 sq. yds.? 40 sq. yds.? 50 sq. yds.?

8. How many acres in 10 sq. chains? 30 sq. ch.? 25 sq. ch.? 75 sq. ch.? 125 sq. ch.? 225 sq. ch.?

Exercise 220.

1. How many square yards in the ceiling of a room [9′ × 15′]? [12′ × 15′]? [15′ × 18′]? [24′ × 27′]?

2. How many square yards in the walls of a room [10′ × 12′ × 9′]? [12′ × 15′ × 10′]? [16′ × 20′ × 12′]?

3. How many acres in a field [10 rds × 16 rds.]? [16 rds. × 20 rds.]? [20 rds. × 40 rds.]? [32 rds. × 40 rds.]?

4. At $25 an acre, what is the value of a field: – [10 ch. × 12 ch.]? [12 ch. × 15 ch.]? [15 ch. × 18 ch.]?

5. What is the width of a field that is 40 rods long, and contains 4 acres? 5 acres? 7 acres? 6 acres?

6. How many acres in a field that is 20 (24, 32) rods wide, and needs a fence 120 (128, 144) rods long?

7. A road is 4 rods wide. What length of the road contains 1 acre? 2 acres? 5 acres? 8 acres?

8. How long a fence would enclose a field of 4 (7, 9) acres, if it is 16 (28, 36) rods long?

Exercise 221.

1. Find the value of a field 40 rods square @ $27 an acre.

2. Find the value of a field 20 ch. square @ $25 an acre.

3. How many acres in a mile of road 1 chain wide?

4. Reduce $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$) sq. yd. to sq. ft. and sq. in.

5. Find the difference between 15 sq. ft. and 15′ square.

6. Find the outside surface of a box 6′ × 4′ × 2′.

7. Find the cost of painting a brick 2″ × 4″ × 8″ @ 9 cents a square foot.

8. What part of an acre is a lot [4 rds. × 10 rds.]? [66 ft. × 55 yds.]? [44 yds. × 55 yds.]?

9. It cost $35 to fence a field 20 rds long at 50 cents a rod. Find the width of the field.

10. How many bricks 2″ × 4″ × 8″, laid on edge, will be required for a walk [4′ × 20′]? [3′4″ × 40′]?

11. Find the cost of painting a 5-foot close board fence around a lot [84′ × 126′] @ 9c. a square yard.

Exercise 222—Solid Measure.

1. What is a cube? a cubic inch? a cubic foot?

2. How many blocks, each one cubic inch, will cover the bottom of a box [3″ × 2″]? [4″ × 5″]? [6″ × 8″]?

3. How many cubic-inch blocks will form two layers in the bottom of a box [3″ × 4″]? [5″ × 6″]? [9″ × 12″]?

4. How many blocks, each 1 cubic inch, will fill a box [2″ × 3″ × 2″]? [3″ × 4″ × 5″]? [4″ × 5″ × 6″]? [12″ × 12″ × 6″]? [12″ × 12″ × 12″]? [1′ × 1′ × 1′]? 1 cub. ft.?

5. How many cub. feet of water will fill a rectangular trough [6′ × 2′ × 1′]? [8′ × 3′ × 2′]? [1 yd. × 1 yd. × 1 yd.]?

6. How many cubic feet of air in a room [15′ × 12′ × 9′]? [15′ × 18′ × 10′]? [18′ × 21′ × 15′]? [24′ × 25′ × 21′]?

7. How much timber is in a beam [20′ × 2′ × 1′]? [30′ × 2′ × 2′]? [20′ × 6″ × 6″]? [27′ × 8″ × 8″]?

8. How much wood in a pile [8′ × 4′ × 4′]? [16′ × 4′ × 4′]? [12′ × 8′ × 4′]? [15′ × 16′ × 4′]? [24′ × 8′ × 8′]?

Exercise 223.

1. How many cubic inches in 1 (2, 3, 5) cub. ft.?

2. How many cubic feet in 1 (2, 3, 5, 8) cub. yd.?

3. How many cub. in. in a block [1′ × 2′ × 5′]? [2′ × 4′ × 5′]? [2′ × 2′ × 15′]? [2′ × 4′ × 25′]?

4. How many cub. ft. of air in a room [12′ × 15′ × 10′]? [15′ × 20′ × 12′]? [16′ × 25′ × 20′]? [24′ × 30′ × 25′]?

5. How many cub. ft. in a stick of timber 2′ square and 50 ft. long? 3′ square and 40 ft. long?

6. How much water in a cubic tank whose length is 5′? 6′? 7′? 8′? 9′? 10′? 11′? 12′?

7. How many loads, each 1 cub. yd., will take away the ground from a cellar [12′ × 15′ × 6′]? [15′ × 18′ × 7′]?

8. How many loads of gravel will put a layer 12″ (6″, 9″) deep on a road 300 yards long and 24 feet wide?

9. There are 24 (30, 36) pupils in a room [15′ × 18′ × 16′]. How much air does that allow per pupil?

Exercise 224.

1. Give the dimensions of a cord of cordwood.

2. How many cords of wood in a pile [8′ × 4′ × 4′]? [16′ × 6′ × 4′]? [16′ × 8′ × 8′]? [24′ × 8′ × 4′]?

3. At $5.25 a cord, what is the cost of a pile :— [16′ × 4′ × 4′]? [16′ × 8′ × 4′]? [24′ × 4′ × 8′]? [32′ × 8′ × 4′]?

4. A pile of wood 16 (24, 32) feet long and 4 (8, 8) feet high contains 2 (6, 16) cords. Find the width.

5. I paid $20 ($21, $24) for a pile of cordwood 4 feet high and 32 (48, 40) feet long. Find the price per cord.

6. How many bricks [2″ × 4″ × 8″] are in a pile [2′ × 4′ × 8′]? [4′ × 4′ × 8′]? [4′ × 5′ × 8′]? [8′ × 8′ × 8′]?

7. How many feet of lumber will a stick of timber 3′ square and 12′ long make, if $\frac{1}{6}$ is lost in the sawing?

8. A plate of copper 3 (4, 5) feet long and 4 (6, 8) feet wide is an inch thick. How thick would it be if made 6 (16, 10 feet) long and 2 (3, 2) feet wide?

Exercise 225.

1. If 2 (3, 4) in. is the unit of length, find unit of volume.

2. Find the volume of a cube whose edge is 1″? 2″? 3″? 6″? 9″? 4′? 5′? 7′? 8′? 10′? 12′?

3. How many cub. ft. in 23 cub. yds.? 33 c. yds.? 25 c. yds.? 21 c. yds.? 230 c. yds.? 99 c. yds.?

4. How many cub. ft. of stone in 122 cords? 132 cords? 25 cords? 125 cords? 250 cords? 375 cords? 750 cords?

5. Find the number of bricks 2″ × 4″ × 8″ required to build a wall 2′ × 8′ × 20′ if $\frac{1}{5}$ of the wall is mortar.

6.

Volume.	Length.	Height.	Thickness.
....	5 (8, 12) ft.	4 (6, 35) ft.	4 (5, 9) ft.
90 (240, 700) c. ft.	9 (8, 10) ft.	5 (6, 35) ft.	....
96 (270, 720) c. ft.	8 (9, 15) ft.	....	3 (6, 24) ft.
20 (175, 672) c. yds.	....	5 (7, 8) ft.	4 (5, 6) ft.

7. Find the volume of rectangular solids :— [1′ 6″ × 1′ × 8″]; [2′ 6″ × 1′ 3″ × 8″]; [4′ 2″ × 1′ 8″ × 2′ 6″].

Exercise 226 - Grain Measure.

How many pounds in a bushel of :—

wheat ?
rye ?
potatoes ?
beets ?
peas ?
oats ?
onions ?
apples ?
barley ?
corn ?
beans ?
carrots ?
clover seed ?
timothy seed ?
flax seed ?
buckwheat ?

What is the cost of :—

1. 30 (15, 45) lbs. wheat @ 64 (72, 80) c. a bu. ?
2. 12 (24, 36) lbs. peas @ 45 (65, 75) c. a bu. ?
3. 10 (40, 50) lbs. clover seed @ $1.80 a bu. ?
4. 24 (12, 36) lbs. barley @ 60 (72, 96) c. a bu. ?
5. 28 (14, 42) lbs. corn @ 48 (52, 64) c. a bu. ?
6. 6 (18, 36) lbs. timothy seed @ $2.40 a bu. ?
7. 40 (30, 42) lbs. buckwheat @ 96 (88, 72) c. a bu. ?
8. 8 (32, 40) lbs. rye @ 49 (63, 70) c. a bu. ?
9. 42 (57, 62) lbs. oats @ 34 (68, 17) c. a bu. ?
10. 6 (20, 48) lbs. onions @ 90 (96, 75) c. a bu. ?
11. 58 (39, 84) lbs. barley @ 96 (48, 24) c. a bu. ?

Exercise 227.

Find the cost of :—

1. 20 bu., 30 lbs. wheat at 66 (80, 96) c. a bu.
2. 30 bu., 36 lbs. barley at 60 (64, 72) c. a bu.
3. 25 bu., 14 lbs. corn at 48 (60, 96) c. a bu.
4. 32 bu., 17 lbs. oats at 30 (38, 40) c. a bu.
5. 24 bu., 15 lbs. peas at 40 (60, 80) c. a bu.
6. 30 bu., 28 lbs. rye at 40 (48, 60) c. a bu.
7. 45 bu., 45 lbs. beans at $1 ($1.20, $1.60) a bu.
8. 28 bu., 36 lbs. clover seed at $1 ($2, $2.50) a bu.
9. 40 bu., 50 lbs. onions at $1 ($1.20, $1.50) a bu.
10. 36 bu., 24 lbs. potatoes at 50 (75, 90) c. a bu.
11. 25 bu., 24 lbs. buckwheat at 36 (48, 64) c. a bu.
12. 75 bu., 12 lbs. timothy seed at $1.60 ($2, $2.40) a bu.
13. 20 bu., 25 lbs. linseed at $1.50 ($2.50, $1.60) a bu.

Exercise 228.

How many pounds in :—

1. 4 bu. peas ? 4 bu., 15 lbs. corn ? 6 bu., 24 lbs. rye ?
2. 8 bu. rye ? 7 bu., 48 lbs. wheat ? 3 bu., 36 lbs. beans ?
3. 9 bu. oats ? 5 bu., 56 lbs. peas ? 8 bu., 35 lbs. beets ?

How many bushels in :—

4. 144 lbs. barley ? 200 lbs. wheat ? 600 lbs. rye ?
5. 136 lbs. oats ? 350 lbs. onions ? 700 lbs. oats ?
6. 168 lbs. rye ? 500 lbs. buckwheat ? 1 ton of peas ?

Find the cost, at the given price per bu., of :—

7. 360 lbs. wheat @ 75c. 485 lbs. barley @ 48c.
8. 480 lbs. peas @ 63c. 676 lbs. corn @ 56c.
9. 720 lbs. beans @ $1.25. 593 lbs. oats @ 68c.
10. 560 lbs. rye @ 95c. 747 lbs. rye @ $1.12.
11. 680 lbs. oats @ 49c. 268 lbs. wheat @ $1.20.
12. 960 lbs. barley @ 73c. 354 lbs. oats @ 17c.

Exercise 229.

1. What is the difference between the weight of 45 bushels of peas and 45 bushels of corn ?

2. Find the weight of a load of 25 bushels of barley and 25 bushels of wheat.

3. What is the difference between the weight of 60 bushels of oats and 34 bushels of onions ?

4. How many bushels of wheat will weigh as much as 30 (25, 45) bushels of barley ?

5. How many bushels of corn will weigh as much as 28 (42, 70) bushels of wheat ?

6. How many bushels of oats will weigh as much as 17 (34, 51) bushels of peas ?

7. How many bushels of clover seed will weigh as much as 30 (45, 60) bushels of rye ?

8. How many bushels of oats will weigh as much as 1 ton, 14 cwt. of carrots ?

Exercise 230—Miscellaneous.

1. How many eggs in 1 doz.? 2 (3, 5, 7, 9) doz.? 2 doz. and 6? 3 doz. and 8? 7 doz. and 9? 8 doz. and 11?

2. How many dozen in 24? 36? 84? 96? 120? 168? 30? 40? 50? 63? 75? 100? 150? 200? 700?

3. How many doz. in 1 gross? 2 (4, 6, 8, 10, 12) gr.?

4. Find cost of a gross of books @ 1 (2, 3) c. each.

5. Find cost of a gross of pens @ 2 (3, 4) for a cent.

6. How many make a score? 2 (3, 4, 6, 8, 9) score?

7. How many score in 40? 60? 80? 76? 38? 99?

8. Find cost of 3 (5, 8) score marbles at 4 for a cent.

9. Bought marbles @ 3 cents a score, and by selling them @ 4 for a cent, gained $1. Find how many I bought.

10. How many sheets in a quire? (2, 3, 6, 9, 12) qrs.?

11. How many reams in 20 quires? 40 qrs.? 80 qrs.? 25 qrs.? 45 qrs.? 75 qrs.? 95 qrs.? 135 qrs.? 157 qrs.?

12. Find cost of 2 (3, 4) reams of paper @ 3 (4, 6) sheets for 5 cents.

13. My hens lay 2 doz. and 8 eggs in a day. Find the value of the eggs laid in a fortnight @ 12 cents a dozen.

Exercise 231.

1. How many lbs. in 1 bbl. flour? pork? beef? salt?

2. Find cost of a bbl. pork @ 8 (9, 11) cents a pound.

3. Find cost of 2 (3, 5) bbls. beef @ 7c. a lb.

4. Find cost of $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{3}{4}$) bbl. of flour at 5 cents a lb.

5. Find value of $\frac{1}{2}$ ($\frac{1}{4}$, $\frac{2}{5}$, $\frac{3}{7}$) bbl. salt at 2 lbs. for 1c.

6. I bought beef at $9.75 a bbl., and sold it at 8c. a lb. Find my gain on 2 (3, 5, 8) bbls.

7. I paid $11.25 a bbl. for pork, and sold @ 9 (10, 11) cents a pound. What is my gain on 2 bbls.? 4 bbls.?

8. How many bbls. of pork @ $12.50 must I sell, @ 10c. a lb., to gain $30? $45? $75? $37.50? $67.50?

9. Find my gain or loss on buying 20 bbls. salt @ $.75 ($.90, $1.25) and selling @ 2 lbs. for a cent.

Exercise 232—Analysis.

1. Find cost of 3 tons hay @ 5 lbs. for 3 (4, 6) cents.

2. Find cost of 20 doz. bananas @ 3 (4, 6) for 5 cents.

3. At 2 (3, 4) oz. for 5 cents, find cost of 10 lbs. tea.

4. Find cost of 12 (15, 18) bu. wheat @ 10 lbs. for 15c.

5. 5 pts. cream cost 45 (55, 75) c. Find cost of 20 gal.

6. At 2 (4, 8) oz. for 5 c., find cost of 1 ton of spice.

7. Find cost of 10 (15, 25) yds. ribbon @ 4 in. for 5c.

8. $40 is paid for a lot (4 × 20) rds. Find cost of 10 ac.

9. If 48 yds. of road cost $144, find cost of a mile.

10. 18 (24, 36) sq. in. cost 72c. Find cost of 1 sq. yd.

11. 500 lbs. coal last 7 days. How long will 4 t. last?

12. How many 3*d.* (5*d.*) stamps can be bought for £1?

13. Find the cost of a section of land @ $25 an acre.

14. 3 (5, 6) bu. oats cost $1.80. Find cost of 680 lbs.

Exercise 233—Review.

1. How many panes [9″ × 12″] can be cut from 36 sq. ft. of glass? From a glass [8′ × 6′]?

2. How many lots [33′ × 99′] can be made of a field [12 rds. × 20 rds.]? [36 rds. × 12 rds.]? [40 rds. × 12 rds.]?

3. How many cent pieces can be placed side by side on a surface [15″ × 24″]? [6′ × 8′]? [5′ 6″ × 5′ 4″]?

4. What are the dimensions of a square field which contains 64 sq. rds.? 100 sq. rds.? 400 sq. rds.? 1 ac.?

5. What are the dimensions of a paper 3 times as long as wide, and containing 75 sq. in.? 300 sq. in.?

6. How many 10-acre fields make a sq. mile? 2 mi. sq.?

7. A field is 40 rods long, and contains 4 (5, 9) acres. Find its width.

8. How many furrows 12″ wide must be made to plow a field whose width is 4 rods? 8 rods? 20 rods? 12 rods?

9. Find the distance travelled in plowing a 10 acre field which is 40 rods long, if the furrows be 12″ wide.

Exercise 234 Sharing.

1. Two parcels weigh 6 lbs., 8 oz. (5 lbs., 6 oz.; 9 lbs., 4 oz.). Find the average weight.

2. Two parcels weigh 15 lbs., 8 oz. One weighs 7 lbs., 6 oz., (8 lbs., 12 oz.; 5 lbs., 10 oz.). Find the other.

3. Two strings reach 75 yds., 1 ft., 6 in. One is 32 yds., 2 ft., 8 in. (28 yds., 1 ft., 7 in.). Find the other.

4. Divide £4 15*s.* 6*d.* between two men, giving one 2 (3, 5) times as much as the other.

5. What is the average size of 3 (4, 5) fields, which together contain 75 ac., 96 sq. rds.

6. One field contains 3 (7, 4) times as much as another. Find each if both contain 32 ac., 120 sq. rds.

7. The average weight of three pipes is 7 cwt., 45 lbs. One weighs 2 lbs. as often as the others weigh 3 lbs. and 4 lbs. Find the weight of each.

8. Divide £45 16*s.* 6*d.* among A, B, and C, giving A 3*d.* as often as B gets 2*d.* and C, 1*d.*

Exercise 235.

1. Divide 15 lbs. sugar into two parcels, one 4 (8, 12) ounces heavier than the other.

2. Two parcels weigh 16 (20, 25) lbs. Find the weight of each, if one weighs 1 lb., 8 oz. (3 lbs., 4 oz.; 2 lbs., 10 oz.) more than the other.

3. A pole 34′ 5″ long is broken into two parts, one 4′ 2″ (6′ 8″, 8′ 4″) longer than the other. Find each.

4. Two sheep cost £3 15*s.* 6*d.* One is worth 15*s.* (7*s.*, 6*d.*; 4*s.* 6*d.*) more than the other. Find cost of each.

5. Two metal plates weigh 2 tons, 15 cwt., 25 lbs. Find weight of each if one weighs 18 cwt. (25 lbs.; 12 cwt., 50 lbs.) more than the other.

6. Divide a field [36 rds. × 40 rds.] into 2 fields, one containing 80 sq. rds. (1 ac., 40 sq. rds.; 2 ac., 120 sq. rds.) more than the other.

Exercise 236.

1. 44 (66, 88) yds. a minute is what rate an hour?

2. How often will a wheel 5′ 6″ in circumference turn, in going 1 mile?

3. A train goes 22 yards a second. Find, in miles, its rate per minute? per hour?

4. Draw the figure of a paper whose sides are 2 : 3.

5. How many sods [2′ × 3′] will be required to sod a lawn 36 yds. square?

6. From a field [15 ch. × 24 ch.] I sell a part [24 rds. × 40 rds.]. Find value of the rest @ $25 an acre.

7. A cubic foot of clay is made into 10 bricks. How many bricks can be made of 1 cub. yard of clay.

8. How many cub. ft. in a stick of timber 6″ (9″, 12″) square and 24 feet long?

9. I row 8 (9, 12) miles an hour, down stream, and 6 (5, 6) miles an hour up stream. How far will I row in still water, in 4 (7, 6) hours?

Exercise 237.

1. How many cub. ft. in $\frac{1}{9}$ ($\frac{5}{9}$, $1\frac{4}{9}$) of a cub. yd.?

2. What part of a dozen is 6 (4, 8, 3, 9, 2)?

3. Find 25 cents' worth of peaches @ 10c. a dozen.

4. If 2 quarts fill 8 glasses, find size of the glass.

5. I paid 1/6 for $1\frac{1}{2}$ doz. eggs. What is the cost of 15 eggs? 24 eggs? 36 eggs? 50 eggs? 75 eggs? 90 eggs?

6. A earns $4.50 a day and B earns $\frac{2}{3}$ as much. Find the weekly wages of the two together.

7. If a gallon of milk costs 20c., what will be the cost of 1 qt.? 3 qts.? 7 qts.? 9 qts.? 20 pints? 36 pts.?

8. How many gallons will fill one dozen pint bottles? 2 doz.? 4 doz.? 8 doz.? 6 doz.? 10 doz.?

9. What part of a bushel is 1 peck? 2 pecks? 1 gallon? 1 quart? 1 pint? 2 pks., 1 gal.? 3 qts., 1 pt.?

Exercise 238.

1. The average weight of 5 (7, 9) steel plates is 1 ton, 16 cwt., 75 lbs. Find their aggregate weight.

2. Find the average size of 8 (6, 11) fields. each of which contains 4 ac., 120 sq. rds., 16 sq. yds., 3 sq. ft.

3. I sold 4 cows for $175.25, and 6 others for $224.75. Find the average price I received for them.

4. I sold 2 horses for £37 16*s*. 8*d*.; 3 horses for £49 12*s*. 9*d*., and 5 horses for £62 10*s*. 7*d*. Find average price.

5. My wood-shed is 20′ × 8′ × 8′ and contains 5 cords of wood. How much more would it hold?

6. How many lots 2 rds. × 10 rds. can be made if 4 fields, each 12 acres, if ¼ (⅙, ⅛) is used for streets?

7. Three loads of wheat average 36 bu., 15 lbs. Find their value @ $.80 ($1.20, $.96) a bushel.

8. Find gain or loss on buying 240 bu. oats @ 24 bu. for $10 and selling @ 8 bu. for $5.

Exercise 239.

1. How much water must be added to 6 (8) gals. of wine @ $3 to make a mixture worth $2 ($1.50) a gal.

2. A man bought 10 gals. wine @ $3, and after putting in enough water to make it worth $2 ($1.50, $1) he sold it @ $2 ($3, $4) a gallon. Find his total gain.

3. A man earns twice as much as a woman, and a woman twice as much as a boy; and 1 man, 2 women and 3 boys earn $8.80 a day. Find weekly wages of each.

4. A man bought a number of lambs @ $2.25, and the same number @ $2.75. How many did he buy for $750?

5. I paid $7,600 for two farms, one @ $28 an acre, and another twice as large @ $36 an acre. Find size of each.

6. It cost $36 to make a fence. If it had been 4 rods shorter it would have cost $32 ($28, $24). Find the length.

7. A fence around a field cost $426. Had the field been 6 rods longer, the fence had cost $438. Find the length of the field.

Exercise 240.

1. Read \$4.56, \$5.08, \$6.40, \$63, \$.75, \$2.875.
2. Show that 9 sq. ft. = 1 sq. yd.
3. Show that 1 sq. rd. = 30¼ sq. yds.
4. Show the number of cub. ft. in 1 cub. yd.
5. Give the standard unit of measure for selling :—

milk
sugar
eggs
coal
wood
grain
oranges
lumber
potatoes
cherries
paper
wheat
hay
cloth
bricks

6. Give the standard unit for measuring :—

roads
fences
boards
grain
population
provinces
mountains
distances
farms
rivers

7. Name some articles sold by the :—

oz.,
qt.,
lb.,
pt.,
ton.
gal.
bushel
barrel
dozen
gross
bag
ream
cental
quintal

8. What are the dimensions of a line? of a surface? of a solid?
9. If ½ foot were the unit of length, what would be the unit of surface? of volume?
10. What is a cord foot? How many are in a cord?
11. Distinguish a short ton from a long ton.
12. Which is the heavier—1 lb. gold or 1 lb. feathers? An ounce of gold or an ounce of lead?
13. In reducing 5*s.*, 6*d.* to pence, what is your multiplier? Is it abstract or denominate?
14. 6*d.* is what part of 1*s.*? 2*s.*? 5*s.*? 20*s.*?
15. In what country is the franc (the mark) the standard unit of value?
16. \$1 a pint is what price a gallon? a gill?
17. Find the weight of a peck of wheat, barley, oats. Find the weight of a gallon of peas, corn, potatoes.
18. What are the aliquot parts of £1? \$1? 1 week? 1 bushel? 1 yard? 1 square yard? 1 cubic yard? 1 pound? 1 gallon?

"SCHOOL HELPS SERIES"

FOR THIRD CLASSES

Canadian History Notes
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

Geography Notes Revised
By C. G. Fraser. Price, 15 cents.

Physiology and Hygiene Notes
By G. E. Henderson and C. G. Fraser. Price, 12 cents.

Junior Language Lessons
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

Exercises in Grammar
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

How We Are Governed
By Geo. A. Fraser. Price, 10 cents.

Mental Arithmetic Exercises—Part I.
By C. G. Fraser. Price, 15 cents.

Exercises in Arithmetic for 3rd Classes
By G. E. Henderson and E. W. Bruce, M.A. Price, 15 cents.
Teachers' edition with answers, Price, 20 cents.

Summary of Canadian History in Verse
By G. W. Johnston. Price, 10 cents.

FOR SECOND CLASSES

Junior Language Lessons
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

Exercises in Arithmetic for 2nd Classes
By G. E. Henderson and E. W. Bruce, M.A. Price, 12 cents.
Teachers' edition with answers, 15 cents.

Mental Arithmetic Exercises—Part I.
By C. G. Fraser. Price, 15 cents.

FOR FIRST CLASSES

Exercises in Arithmetic for 1st Classes
By Miss R. Church and Miss A. Harding. (For Teachers only).
Price, 20 cents.

Phonics, Vocal Expressions and Spelling
By Miss R. Church and Miss A. Harding. Price, 30 cents.

Mental Arithmetic Exercises—Part I.
By C. G. Fraser. Price, 15 cents.

Sent postpaid on receipt of price or through dealers.

"SCHOOL HELPS SERIES"

⁂

FOR FOURTH CLASSES

Canadian History Notes
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

British History Notes
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

Entrance Geography
By C. G. Fraser. Price, 15 cents.

Physiology and Hygiene Notes
By G. E. Henderson and C. G. Fraser. Price, 12 cents.

Exercises in Composition
By G. E. Henderson and C. G. Fraser. Price, 15 cents.

Exercises in Grammar
By G. E. Henderson and G. A. Fraser.

How We Are Governed
By Geo. A. Fraser. Price, 10 cents.

Mental Arithmetic Exercises—Part II.
By C. G. Fraser, Price, 15 cents.

Exercises in Arithmetic for 4th Classes
By G. E. Henderson and W. E. Groves. Price, 15 cents
Teachers' edition with answers, 20 cents.

Summary of Canadian History in Verse
By G. W. Johnston. Price, 10 cents.

Manual of Punctuation
By J. P. Taylor. Price, 12 cents.

Entrance Examination Papers for the Past Five Years
Price, 10 cents. In lots of two or more, 7 cents.

⁂

Sent postpaid on receipt of price or through dealers. Address—

THE EDUCATIONAL PUBLISHING CO.,
36 Shuter Street, - TORONTO, ONT.